UMO - AIR OPNS

Senior Transportation Officer Qualification Course
The Unit Movement Officer During Air Operations

Motivator

In this lesson, the role of the Unit Movement Officer during Air Operations will be discussed.

To support the transport of personnel and materiel, air mobility is set up as a network of systems combining:

- Airlift
- Airdrop
- Aeromedical evacuation
- Air refueling
- Air mobility support assets, processes, and procedures

As a Senior Transportation Officer, your familiarization with the Unit Movement Officer's duties and responsibilities during Air Operations will help you and others better accomplish the transportation mission.

In this lesson, you will learn the Unit Movement Officer's role during Air Operations.

Air mobility is a network of systems that combines airlift, airdrop, aeromedical evacuation, air refueling, and air mobility support assets, processes, and procedures into an integrated whole to support the transport of personnel and materiel.

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Lead-in

LEAD-IN

As the commanders' transportation representative, the Unit Movement Officer must know the unit's mission and the commanders' intent for the appropriate coordination, planning, and execution to take place within the overall "big picture".

During contingencies, Army and Air Force personnel are frequently situated together at an airfield, where opportunities for logistics cooperation and mission flexibility abound.

As a result, Army logisticians who understand the organizational structure, joint warfighting roles, and logistics methods of the Air Force will be in a better position to streamline logistics-related operations across a full range of military operations under the control of a joint task force commander.

The commander is responsible for all aspects of deployment preparation, training, and execution and appoints the Unit Movement Officer as his designated representative.

The Unit Movement Officer must know the unit's mission and the commander's intent for the appropriate coordination, planning, and execution to take place within the overall "big picture".

A Joint Forces airfield serves as debarkation points for ground and air units, supplies, and equipment and support a multitude of logistics functions of both services.

They are ideal sites for fuel storage facilities, petroleum and water pipelines, hydrant systems, electrical power generators, rail links, road networks, and flat, dry storage.

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The Unit Movement Officer Responsibilities

Force projection encompasses a range of processes including mobilization, deployment, employment, sustainment, and redeployment.

Since the Unit Movement Officer (UMO) is the commander's appointed representative and attends to the details of getting the unit ready for movement, he/she must focus on thorough planning, coordination, training, and execution of unit deployment, employment, and sustainment missions.

Specific responsibilities of the UMO include:

- Preparing and maintaining documentation for unit movement in the Transportation Coordinator's Automated Information for Movement System II (TC-AIMS II). This includes maintaining the unit movement data, from which the organizational equipment list (OEL) is generated, and creating and processing the unit deployment list (UDL).
- Preparing the unit movement plan.
- Planning convoy movements.
- Requesting commercial and military transportation.
- Coordinating with higher headquarters and support activities for unit movements.
- Coordinating logistical support for the move.

Force projection encompasses a range of processes including mobilization, deployment, employment, sustainment, and redeployment.

Deployment, employment, and sustainment are inextricably linked so one cannot be planned successfully without the others.

The well trained Unit Movement Officer will be prepared for variables that may require changes to plans and data, so they must be technically proficient to meet the changing demands.

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The Unit Movement Officer Responsibilities (cont.)

The responsibilities of a UMO include:

- Coordinating with the Arrival/Departure Airfield Control Group (A/DACG) and Contingency Response Element (CRE) at the Aerial Port of Embarkation (APOE) and Aerial Port of Debarkation (APOD).
- Coordinating with the Surface Deployment and Distribution Command (SDDC) representatives at the Seaport of Embarkation (SPOE) and Seaport of Debarkation (SPOD).
- Coordinating Transportion of the units' organic equipment and cargo.
- Establishing and training unit loading teams.
- Obtaining 463L pallets, containers; and blocking, bracing, packing, crating, tie-down (BBPCT) materials.
- Ensuring all cargo is properly labeled with Military Shipping Labels (MSLs) and Radio Frequency (RF) tags when directed.
- Ensuring unit personnel are authorized to certify Hazardous Material (HAZMAT).
- Ensuring packing lists are prepared for containers.
- Maintaining movement binders or continuity books that include appointment orders, training certificates, recall rosters, OEL, transportation requests, and BBPCT requirements.

This level of readiness and training requires school-trained, dedicated mobility officers, Unit Movement Officers, hazardous cargo certifiers, and load planners.

Commanders appoint, in writing, a school-trained logistics/transportation officer or NCO (E-6 or above) as a Unit Movement Officer, and an alternate (E-5 or above).

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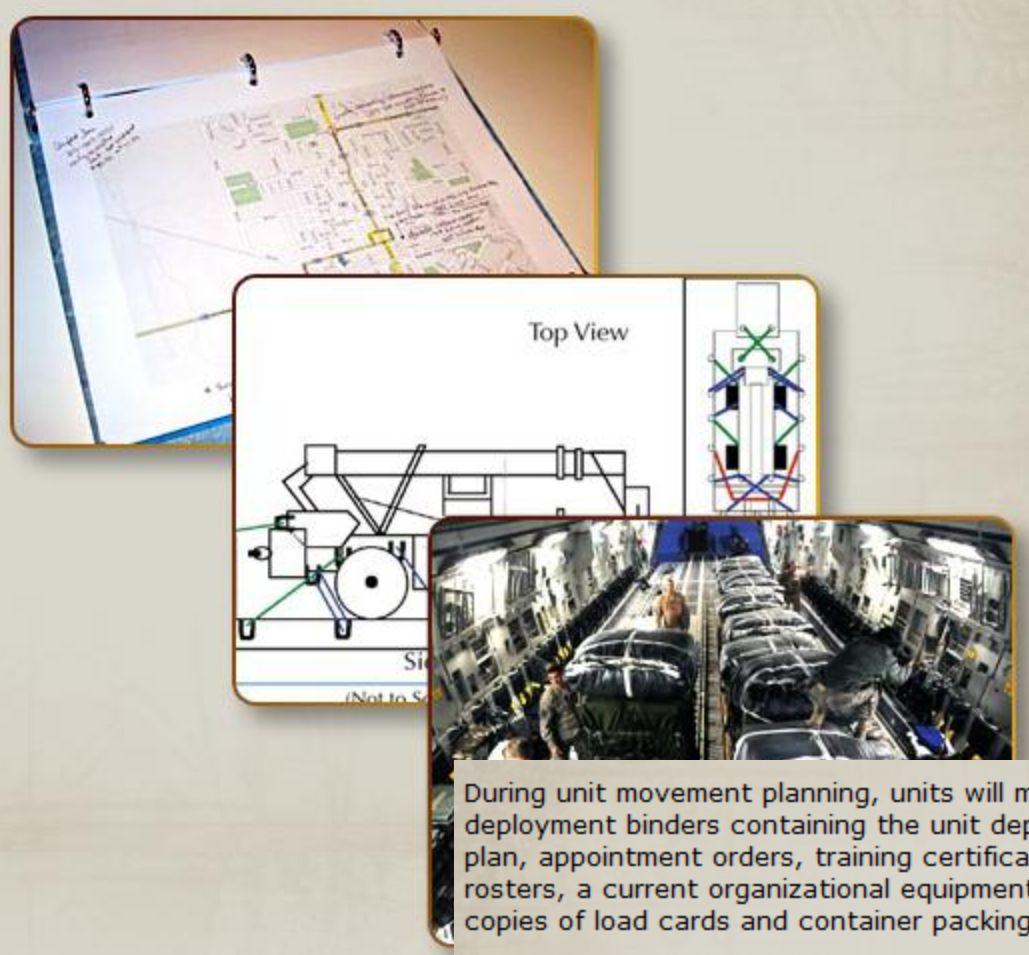
The Unit Movement Officer During Air Operations

The Unit Deployment Binder

The Unit Movement Officer maintains a unit deployment binder for reference and continuity.

The following is a list of recommended unit deployment binder contents:

- Unit movement Standard Operating Procedures (SOPs)
- Appointment orders and training certificates for Unit Movement Officers (UMOs), load teams, and HAZMAT certifiers
- Recall rosters and instructions
- Coordination requirements for plan execution and a list of supporting agencies and Points of Contact (POCs)
- Major equipment shortage list
- Supply list by supply support activity, coordination requirements, and prepared requisitions
- List of BBPCT on hand and due out
- OEL



During unit movement planning, units will maintain deployment binders containing the unit deployment plan, appointment orders, training certificates, recall rosters, a current organizational equipment list, and copies of load cards and container packing lists.

Units will also maintain prepared copies of transportation requests, convoy movement requests and special handling permits, and blocking, bracing, packing, crating, and tie-down requirements.

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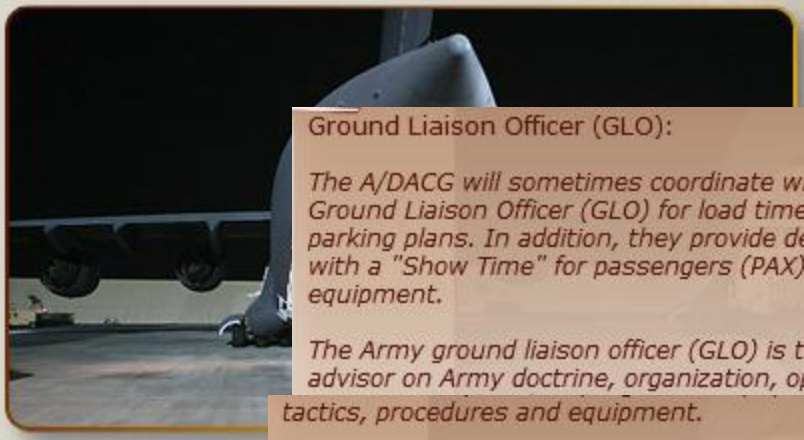
Arrival/Departure Airfield Control Group

The Arrival/Departure Airfield Control Group (A/DACG) is an ad hoc Army organization established to support the U.S. Air Force Tanker Airlift Control Element in the off-load ramp area to help control and support arrival at the APOD and departure from the APOE.

Elements of a movement control team and an inland cargo transfer company typically operate the A/DACG, however, the mission can be performed by almost any unit with the properly trained personnel and equipment.

More in-depth discussion of the A/DACG will follow in the APOE and APOD lessons.



Ground Liaison Officer (GLO):

The A/DACG will sometimes coordinate with a Army Ground Liaison Officer (GLO) for load times and aircraft parking plans. In addition, they provide deploying units with a "Show Time" for passengers (PAX) and equipment.

The Army ground liaison officer (GLO) is the primary advisor on Army doctrine, organization, operations, tactics, procedures and equipment.

Joint Air Cargo Operations Team (JACOT):

Before the establishment of JACOT, interservice cooperation was limited.

In June 2005, the Marine Corps 2d Force Service Support Group Forward and Combat Logistics Regiment 25 took the lead in transitioning the A/DACG and Strategic A/DACG into the JACOT.

The transformation included collocating the personnel movement side of the operation with the cargo movement side, including the transient billeting area for incoming and outgoing units.

The JACOT is unique because it involves all four military services. The division of labor is what sets the JACOT apart.

When the aircraft ramp is lowered, the joint team offloads the cargo. The average offload time for a full C-17 is about 20 minutes.

The Arrival/Departure Airfield Control Group supports the U.S. Air Force Tanker Airlift Control Element in the off-load ramp area.

Its mission is airfield clearance operations. The Tanker Airlift Control Element supervises off-loading arriving aircraft.

The Arrival/Departure Airfield Control Group escorts loads to the holding area and assists the unit in assembling and moving to the marshalling area.

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The Unit Movement Officer During Air Operations

Key Points

The following key points involving the Unit Movement Officer during Air Operations were discussed:

KEY POINTS

- UMO responsibilities
- Unit deployment binder
- Arrival/Departure Airfield Control Group

The following key points involving the Unit Movement Officer during Air Operations were discussed: UMO responsibilities, the unit deployment binder, and the Arrival/Departure Airfield Control Group.

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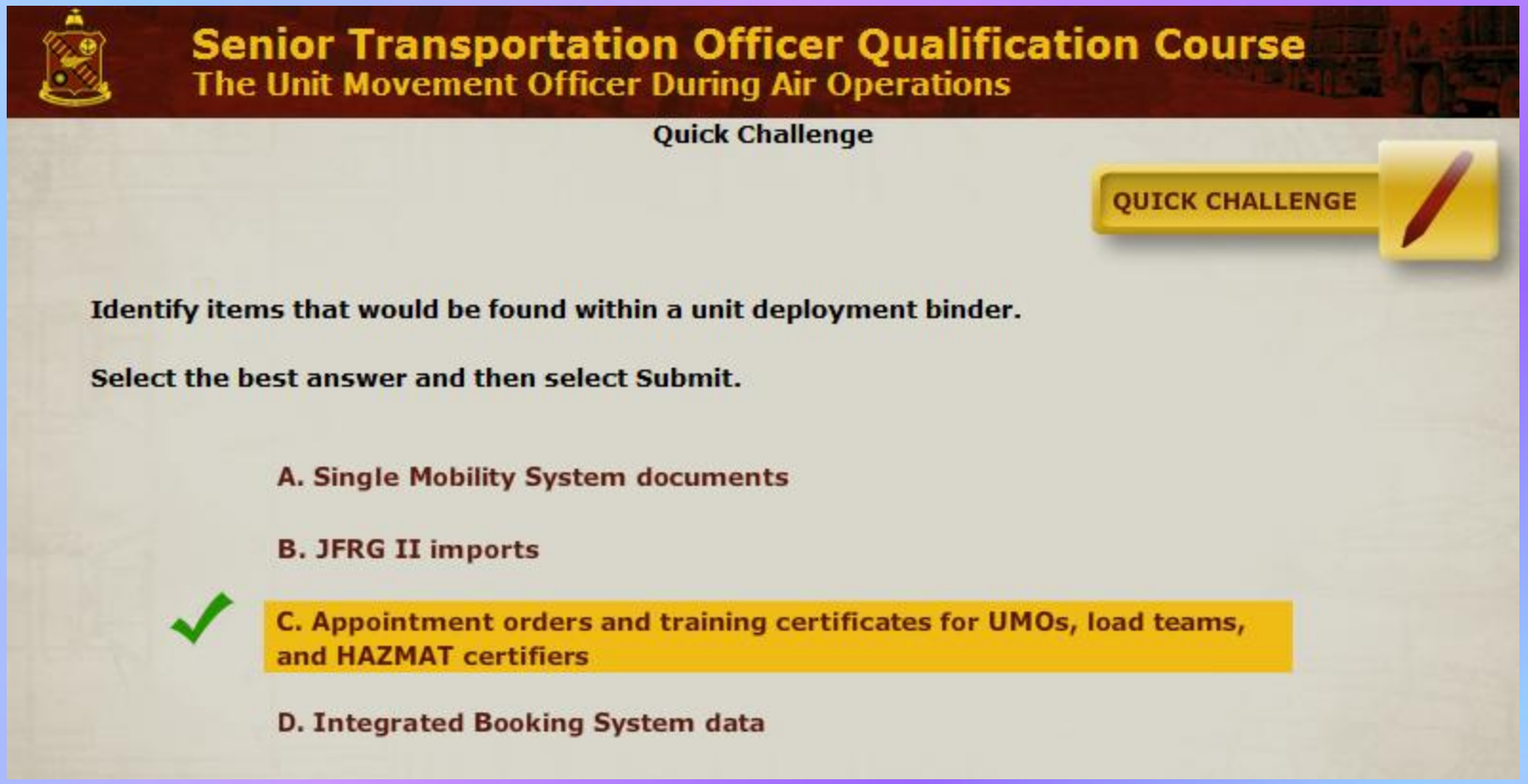
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The Unit Movement Officer During Air Operations
Quick Challenge
QUICK CHALLENGE
Identify items that would be found within a unit deployment binder.
Select the best answer and then select Submit.
A. Single Mobility System documents
B. JFRG II imports
C. Appointment orders and training certificates for UMOs, load teams, and HAZMAT certifiers
D. Integrated Booking System data

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Senior Transportation Officer Qualification Course
The Unit Movement Officer During Air Operations

Theater Airlift

Operationally, the airlift mission links airlift terminals in a theater to other terminals assigned to a combatant commander, to provide common-user airlift in support of joint operations.

The lowest practical level for assigning and operation of common-user airlift forces is usually at the theater level.

In certain circumstances, theater airlift forces may operate between theaters or between the continental U.S. and an overseas theater.

These forces have a dual identity in that they are both air operating forces and an element of the logistic support system.

Operationally, the airlift mission links airlift terminals in a theater to other terminals.

Airlift's primary mission is to establish air lines of communications between air terminals, as required for operations.

The Air Mobility Command (AMC) was established on June 1st, 1992 and is headquartered at Scott Air Force Base in Illinois. Its mission is to provide global air mobility, sustainment operations, and humanitarian support at home and around the world.

Able to adapt to varied operational environments, from major air facilities to austere field conditions, AMC plays a major part of the rapid mobility strategy that U.S. Forces utilize, when responding to global threats.

AMC typically employs the C-5M Galaxy, KC-10 Extender, C-17 Globemaster III, C-130J Super Hercules, KC-135 Stratotanker, commercial contractors, and the Civil Reserve Air Fleet to fulfill airlift requirements.

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The Unit Movement Officer During Air Operations

Theater Airlift Aircraft Categories

Theater Airlift aircraft are mission designated as either administrative or combat loaded.

Administrative loading: gives primary consideration to achieving maximum use of aircraft passenger and cargo capacities, without regard to ground force tactical considerations.

Combat loading: arranges personnel and material to arrive at their intended destination in an order and condition so that they are ready for immediate use.

For movement planning purposes, Theater Airlift aircraft are designated either administrative or combat loaded.

Administrative loading gives primary consideration to achieving maximum use of aircraft passenger and cargo capacities, without regard to ground force tactical considerations.

Combat loading arranges personnel and material to arrive at their intended destination in an order and condition so that they are ready for immediate use.

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Senior Transportation Officer Qualification Course
The Unit Movement Officer During Air Operations

Theater Airlift Tasks

The UMO must also understand his/her role within most Theater Airlift operations that tasks aircraft to perform one of these six basic tasks:

- **Deployment**: administrative or combat movement of personnel, units, and materiel into or within an Area of Responsibility (AOR) or Joint Operations Area (JOA) before they engage in operations.
- **Employment**: combat movement of units as an integral part of their operations.
- **Routine Sustainment**: administrative air movement of materiel and personnel to reinforce or resupply forces already deployed or employed in operations.
- **Combat Sustainment**: combat movement of supplies, materiel, and personnel to reinforce or resupply units already engaged in combat operations.
- **Redeployment**: combat or administrative air movement of personnel, units, and materiel from deployed positions within an AOR or JOA.
- **Force Extraction**: combat air movement of personnel, units, and materiel from positions in the immediate vicinity of enemy forces.

Unit Movement Officers must understand the "big picture" and where their role fits within Theater Airlift Operations.

Operationally, the airlift mission links airlift terminals in a theater to other terminals.

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The Unit Movement Officer During Air Operations

Air Sustainment

Air sustainment is the intratheater movement of supplies using Army or Air Force aircraft, versus transporting them by ground convoys.

Moving cargo by air has two huge advantages over ground transportation. First, materiel usually arrives at its destination from three to four days faster.

Second, Soldiers and equipment are not placed at risk by traveling on dangerous roads to deliver supplies.

This Convoy Mitigation provided by air sustainment is vital because it keeps Soldiers and materiel out of the reach of Improvised Explosive Devices (IEDs).

For example: For every 16,000 pallets of cargo that are moved by air, you remove 4,000 trucks of cargo, 800 convoy-protection or convoy-escort platforms, and at least 5,200 Soldiers and civilians off perilous routes and exposure to IEDs.

Moving cargo by air has these two huge advantages over ground transportation: reduction of customer wait time and Convoy Mitigation.

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Senior Transportation Officer Qualification Course
The Unit Movement Officer During Air Operations

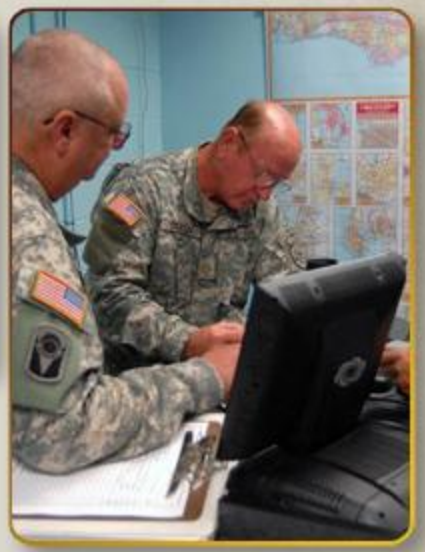
Terminal Operations Branch

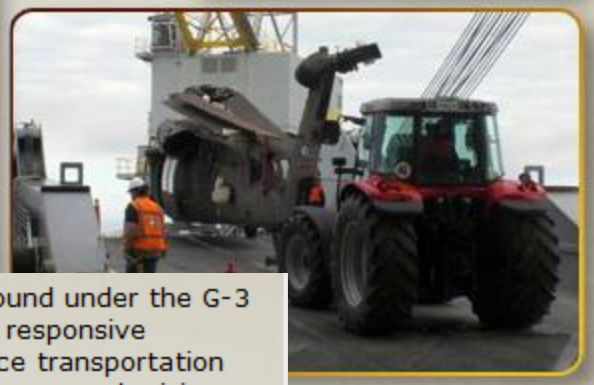
Your Senior Transportation Officer duties may include interaction with or being part of the Terminal Operations Branch.

This terminal element advises on the use, coordination, and implementation of subordinate terminal units.

They monitor and coordinate operations for all terminal operations in the theater; motor, rail, intermodal, air, and sea and maintain status of terminal transportation assets in the area of operations using the following skilled personnel:

- Three Terminal Operations Officers
- Transportation Supervisor
- Operations Sergeant
- Movements Supervisor
- Movements NCO
- Two Movements Specialists





The Terminal Operations Branch, found under the G-3 Deputy Chief of Staff, synchronize responsive deployment and sustainment surface transportation for the Department of Defense in peace and crisis.

Cargo distribution and port management are the two critical process components of the surface distribution mission.

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The Unit Movement Officer During Air Operations

Airlift Coordination Cell

The Airlift Coordination Cell (ALCC) deals only with Intra-Theater Airlift System (ITAS) fixed wing assets.

They send notifications of delay, cancellation, early or late departures and arrivals with regard to overall flight status via phone, the NATO Effective Visibility and Execution (EVE) scheduling system, or e-mail.

The Airlift Operations Branch of the ALCC advises on the use and implementation of Army and Air Force air assets by:

- Providing guidance on positioning of air assets throughout the theater.
- Receiving airlift requests from the Transportation Command Element (TCE).
- Maintaining status of air assets in the area of operations.
- Monitoring assigned airlift assets to ensure they are not over tasked.
- Reviewing, validating, and recommending changes to regularly scheduled airlift routes.

Within the Joint Air Operations Center, an Airlift Coordination Cell plans, coordinates, and manages the execution of theater airlift operations. This centralized control and decentralized execution enhances the timely integration of theater airlift into the overall theater air effort and, consequently, into the theater campaign as a whole.

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Senior Transportation Officer Qualification Course
The Unit Movement Officer During Air Operations

Key Points

The following key points involving the Unit Movement Officer during Theater Airlift Operations were discussed:

KEY POINTS

- Theater Airlift
- Theater Airlift categories and tasks
- Air Sustainment
- Terminal Operations Branch
- Airlift Coordination Cell

The following key points involving the Unit Movement Officer during Theater Airlift Operations were discussed: Theater Airlift, Theater Airlift categories and tasks, Air Sustainment, the Terminal Operations Branch, and the Airlift Coordination Cell.

As a Senior Transportation Officer operating either within a distant theater or the continental United States, you may need to coordinate or contribute, directly or indirectly, to the efforts of these air operations elements.

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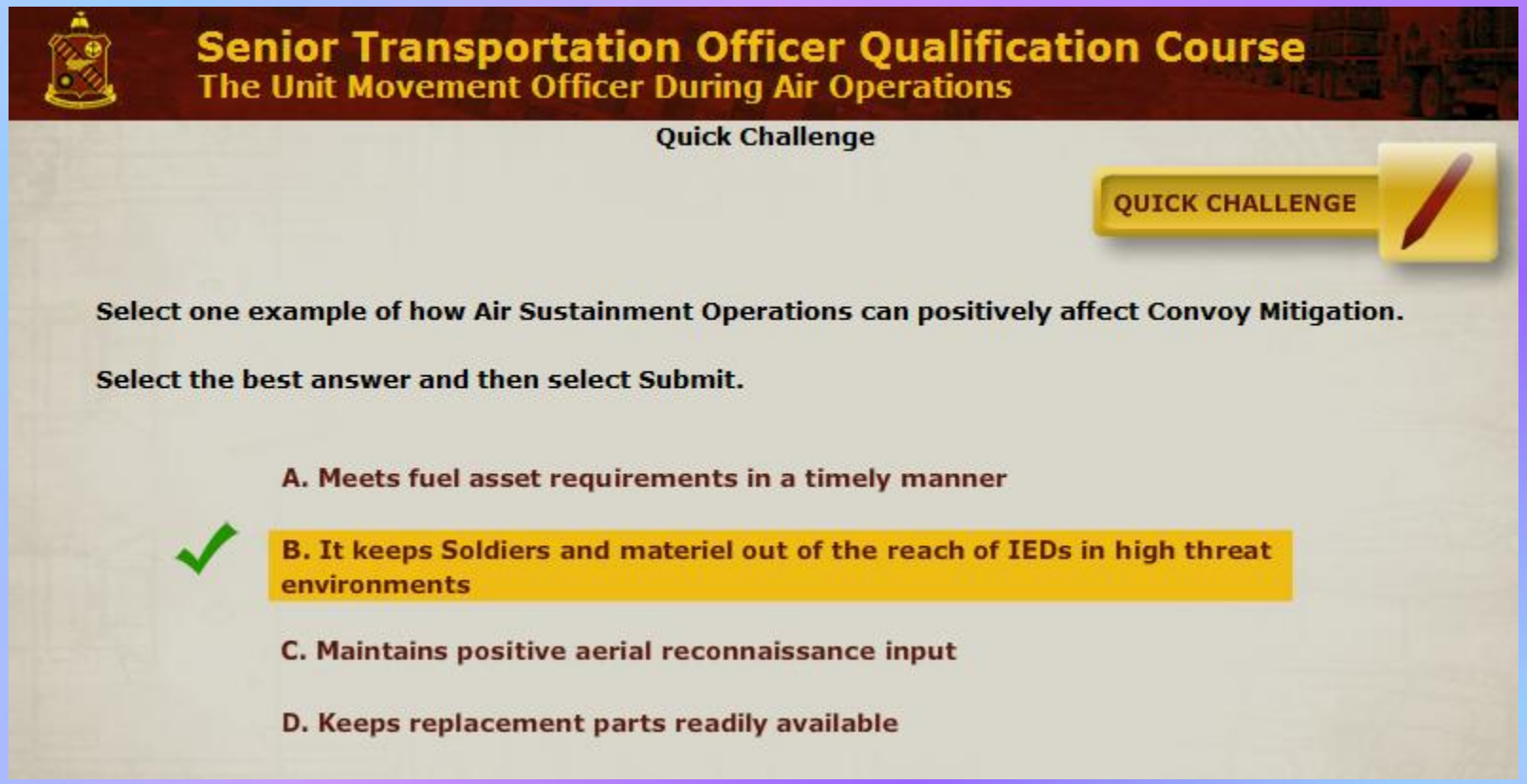
Senior Transportation Officer Qualification Course
The Unit Movement Officer During Air Operations
Quick Challenge
QUICK CHALLENGE
Select one example of how Air Sustainment Operations can positively affect Convoy Mitigation.
Select the best answer and then select Submit.
A. Meets fuel asset requirements in a timely manner
B. It keeps Soldiers and materiel out of the reach of IEDs in high threat environments
C. Maintains positive aerial reconnaissance input
D. Keeps replacement parts readily available

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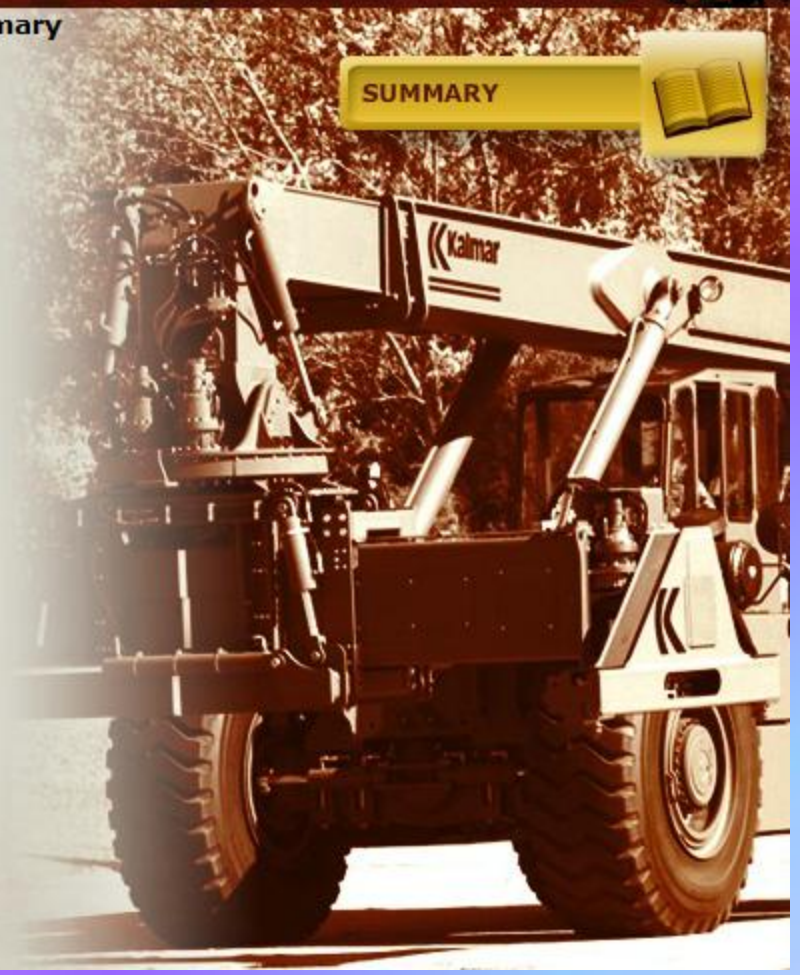
Senior Transportation Officer Qualification Course
The Unit Movement Officer During Air Operations

Summary

In this lesson, you have learned about the responsibilities of the Unit Movement Officer during Air Operations, including:

- General responsibilities
- Unit Deployment binder
- A/DACG
- Theater Airlift
- Air Sustainment
- Coordinating transportation elements



In this lesson, you have learned about the responsibilities of the Unit Movement Officer during Air Operations, including: overall general responsibilities; the Unit Deployment binder; the Arrival/Departure Airfield Control Group; Theater Airlift; Air Sustainment, and coordinating with other transportation elements.

As demonstrated, there are many players within the logistics and transportation community that a Senior Transportation Officer needs to be aware of and their roles in contributing to the overall success of Air Operations within the operational environment.

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Senior Transportation Officer Qualification Course
APOE Operations

Motivator

In this lesson, you will learn what events take place at the Aerial Port of Embarkation (APOE).

Having a clear understanding of these procedures will increase your working knowledge of the deployment process.

As a Senior Transportation Officer, your application of this knowledge will ensure proper supervision and confirmation of those duties and responsibilities of the Unit Movement Officer (UMO).

In this lesson, you will learn about Aerial Port of Embarkation procedures and the responsibilities of those who are supporting and supported during this part of the deployment process.

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APOE Operations

Lead-in

LEAD-IN

Air transport capabilities play a major role in Joint Force strategic deployment, operational movement, maneuver, maneuver support, and maneuver sustainment.

Immediate response and sustainment of CONUS-based elements is accomplished via strategic airlift planned, managed, and executed through the many agencies of the Defense Transportation System (DTS), discussed in the lesson *Roles and Organization of DoD and the U.S. Army.*

The Aerial Port of Embarkation (APOE) is the transition point for Army units deploying by air to interface with the Air Mobility Command (AMC) component of the United States Transportation Command (USTRANSCOM).

There are four distinct areas associated with an APOE:

- Marshalling Area
- Alert Holding Area
- Call Forward Area
- Loading Ramp Area

During almost any airlift activity, there will normally be Army and Air Force personnel working together to process, inspect, document, and load the personnel and equipment.

At some locations, the Army must carry out all of the Aerial Port of Embarkation functions and in those cases, the Army personnel are trained and certified to fulfill the Air Force element roles and responsibilities.

The duties of the Departure Airfield Control Group and the Contingency Response Element can be found in Field Manual (FM) 3-35, Army Deployment and Redeployment, Appendix G, as part of operations at an APOE.

Doctrine terminology changes imply the Tanker Airlift Control Element term to be interchangeable with the term, Contingency Response Elements.

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APOE Operations

Air Mobility Operations

A Senior Transportation Officer or UMO should consider these principles when planning air mobility operations:

- Minimize movement congestion and vulnerability by reducing the time units and materiel spend en masse at forward terminals.
- Maximize the productivity and survivability of the airlift fleet by minimizing aircraft ground times at forward locations.
- Minimize sortie requirements by repackaging all materiel for air shipment; ensuring that combat personnel travel with their maximum authorized individual loads of rations, ammunition, or other personal protective equipment; and splitting units into air-essential and surface movement echelons (whenever possible).
- Ensure that personnel are adequately fed, rested, and protected at en route stops.
- Deploy the personnel and communications equipment necessary to track and report on all air movements.

Planning air mobility operations is a complicated process involving a few basic principles and numerous interdependent considerations.

Service components must facilitate their airlift movement process.

This responsibility includes performing and arranging to: bring units and materiel to departure terminals; prepare those resources for air movement; provide support services (meals, medical, billeting, and other appropriate services) to transient and arriving units; receive and transport units and materiel from arrival terminals; and prepare all manifests, movement documents, and reports related to the actual movement.

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APOE Operations

Marshalling Area

The primary purpose of the Marshalling Area is to provide a location near the Aerial Port of Embarkation (APOE) to assemble and receive convoys and process vehicles before they are staged for loading.

The deploying unit:

- Establishes liaison and coordinates with the Departure Airfield Control Group (DACG) to discuss aircraft allowable cabin load, pallet restrictions, aircraft configuration, equipment preparation requirements, airflow schedule, and any other issues impacting deploying unit preparation and processing.
- Prepares vehicles and equipment.
- Ensures adequate shoring material is available.
- Prepares personnel and cargo manifests.
- Assembles personnel, supplies, and equipment into aircraft loads.
- Ensures planeload commanders are appointed and briefed.
- Provides escorts for sensitive items.
- Builds 463L pallets.

The primary purpose of a Marshalling Area is to provide a location near the Aerial Port of Embarkation for activities that assemble personnel, supplies, and equipment and make final preparations for air shipment.

These activities are the overall responsibility of the deploying commander.

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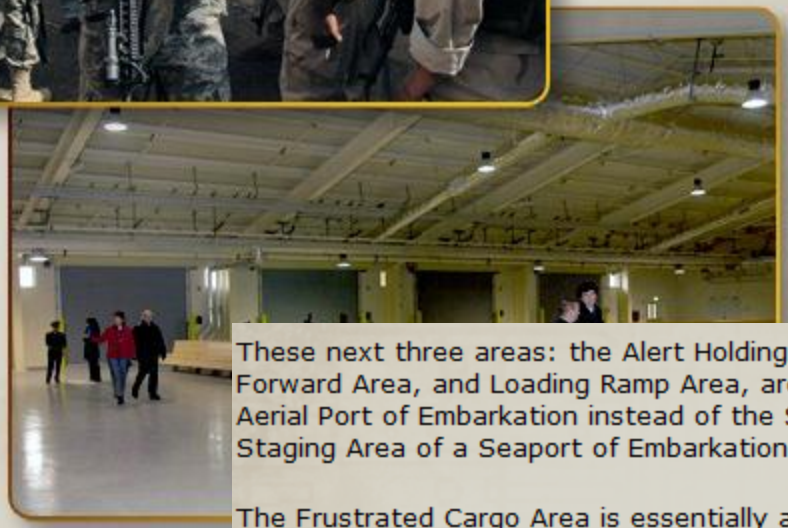
APOE Operations

Alert Holding Area

The Alert Holding Area is the responsibility of the DACG, normally located near the departure airfield, and is used to assemble, inspect, hold (frustrated cargo), and service aircraft loads.

Control of loads is transferred from the individual units to the DACG, that performs the following:

- Ensures loads arrive at the scheduled times.
- Receives, inventories, inspects, and controls aircraft loads as they arrive.
- Ensures required 463L pallets and BBPCT are available and verifies weight and balance markings.
- Inspects documentation for accuracy and completeness, including HAZMAT, and establishes a discrepancy correction area.
- Provides or coordinates emergency maintenance, defueling, related services, and CHE/MHE support.



These next three areas: the Alert Holding Area, Call Forward Area, and Loading Ramp Area, are used at an Aerial Port of Embarkation instead of the Single Staging Area of a Seaport of Embarkation.

The Frustrated Cargo Area is essentially a "Penalty Box" for cargo with significant problems of preparation and/or documentation which may ultimately be re-sequenced to future chalk loads due to airlift time constraints.

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APOE Operations

Call Forward Area

The Call Forward Area is the joint responsibility of the Contingency Response Element and the DACG, and is the location for the joint inspection of deploying unit equipment and cargo.

The DACG, the deploying unit, and the CRE conduct this joint inspection and complete a DD Form 2133 (*Joint Airlift Inspection Record*) to indicate to the loadmaster that it has completed the required inspection.

Deficiencies are corrected by the unit and rechecked by the inspection team.

Once the inspection sequence is complete, the deploying unit arranges its vehicles, pallets, and equipment into load or chalk sequence.

A final briefing is provided to deploying troops and the CRE reviews all manifests for accuracy.

The Call Forward Area is that portion of the departure airfield where the joint inspection is conducted by the Departure Airfield Control Group and the Contingency Response Element.

A final briefing is provided to deploying troops and all manifests are reviewed for accuracy and control of the load or troops shifts to the Contingency Response Element, serving as representatives of the Air Mobility Command.

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APOE Operations

Loading Ramp Area

The Loading Ramp Area, including the Ready Line Area, is controlled by the Contingency Response Element (CRE).

At this point, control of units, for movement purposes, passes to the Air Mobility Command (AMC).

The Chalk Commander:

- Follows directions of the load team chief.
- Monitors and controls aircraft passengers.
- Retains one copy of the final passenger/cargo manifest.
- Provides assistance in loading and securing the load, as required.
- Ensures vehicle and equipment operators follow loading instructions of the load team chief or loadmaster.

The load team:

- Receives loads at the ready line, loads and secures vehicles and equipment in the aircraft under the loadmaster's supervision.
- Provides the loadmaster with manifests.
- Informs the CRE of load completion time.

Additional briefings and instructions may be conducted in the Loading Ramp Area.

Under supervision of the aircraft loadmaster or load team chief, the supported service loads and restrains cargo aboard the aircraft.

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Senior Transportation Officer Qualification Course
APOE Operations

Key Points

The following key points involving the activities that occur at the Aerial Port of Embarkation were discussed:

KEY POINTS

- The DACG and CRE
- The Marshalling Area
- The Alert Holding Area
- The Call Forward Area
- The Loading Ramp Area

The following key points involving the activities that occur at the Aerial Port of Embarkation were discussed: the Departure Airfield Control Group and Contingency Response Element, the Marshalling Area, the Alert Holding Area, the Call Forward Area, and the Loading Ramp Area.

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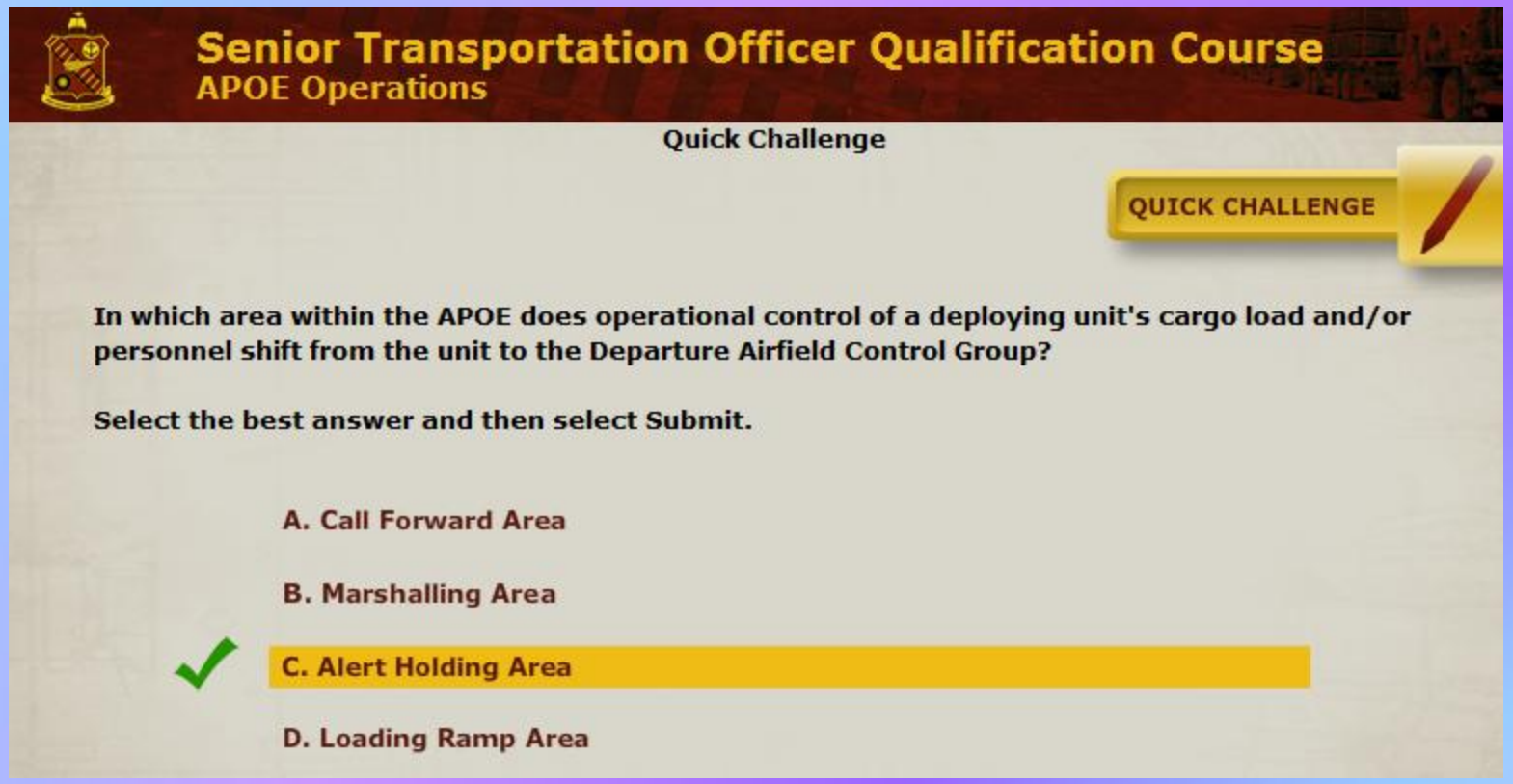
Senior Transportation Officer Qualification Course
APOE Operations
Quick Challenge
QUICK CHALLENGE
In which area within the APOE does operational control of a deploying unit's cargo load and/or personnel shift from the unit to the Departure Airfield Control Group?
Select the best answer and then select Submit.
A. Call Forward Area
B. Marshalling Area
C. Alert Holding Area
D. Loading Ramp Area

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Senior Transportation Officer Qualification Course
APOE Operations

Summary

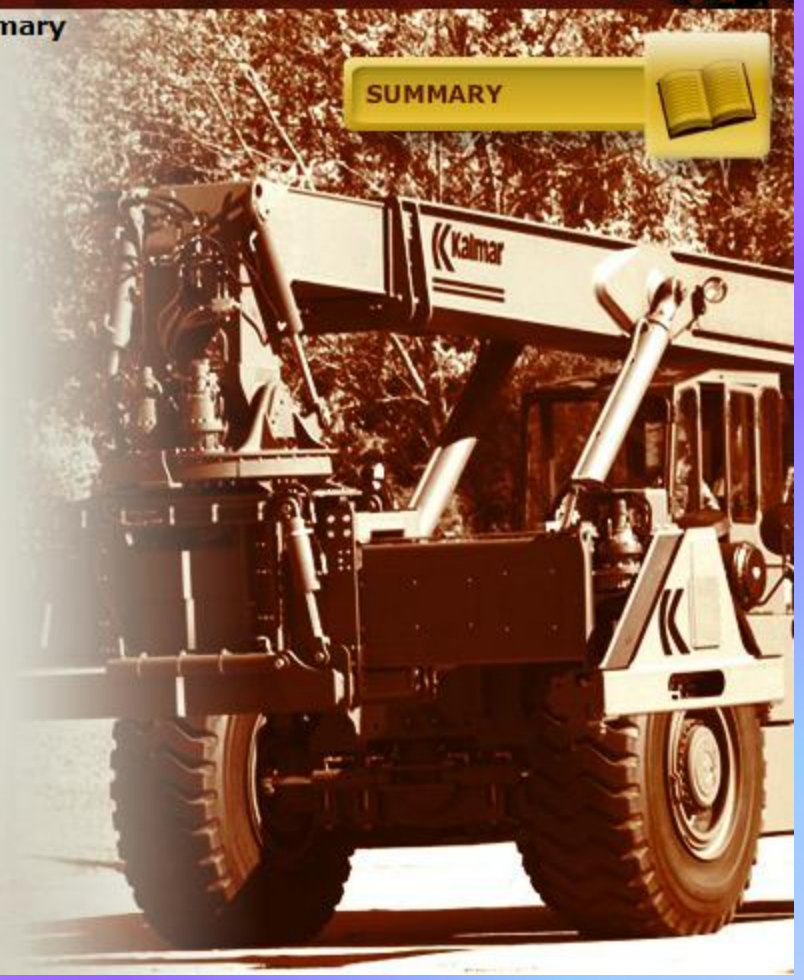
In this lesson, you have learned about the Aerial Port of Embarkation activities that a Unit Movement Officer must understand and comply with.

You also learned that the individual deploying units have responsibilities and interactions with other elements during this process.

As a Senior Transportation Officer, you may be required to supervise or coordinate these activities with other agencies or representatives of the Defense Transportation System.

In this lesson, you learned that various elements must coordinate their efforts to successfully and efficiently deploy from an Aerial Port of Embarkation.

Joint cooperation between the services is paramount to a smooth transition from the installation to boarding Air Transport.



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Senior Transportation Officer Qualification Course
Aircraft Characteristics

Motivator

In this lesson, you will learn about the characteristics of several of the main aircraft types presently utilized for strategic, operational, and tactical airlift missions.

Knowing these characteristics will assist the transportation planner with the capabilities of the various aircraft for efficient mission assignment.

As a Senior Transportation Officer, your application of this knowledge will help you and others accomplish transportation missions.

In this lesson, you will learn about the characteristics of several of the main aircraft types presently utilized for strategic, operational, and tactical airlift missions.

Not all aircraft types will be covered and one must understand there will be additions as newer aircraft assets are fielded.

UMO - AIR OPNS

Senior Transportation Officer Qualification Course
Aircraft Characteristics

Lead-in

LEAD-IN

Airlift is a cornerstone of global force projection and vital to U.S. forces in today's operational environment.

It provides the means to rapidly deploy and redeploy forces, on short notice, to any location worldwide.

Airlift operations transport and deliver forces and materiel through the air in support of the U.S. National Military strategic, operational, and/or tactical objectives by rapidly transporting personnel and materiel to and from or within a theater.

Airlift operations are defined by the nature of the mission rather than the airframe used.

Our discussion will cover both Intertheater and Intratheater environments.

Airlift operations are defined by the nature of the mission rather than the airframe used.

Our discussion will cover both Intertheater and Intratheater airlift environments and the aircraft utilized to complete the mission.

UMO - AIR OPNS


Senior Transportation Officer Qualification Course
Aircraft Characteristics
Main Menu
BRANCHING
Intertheater Airlift
Incomplete
Intratheater Airlift
Incomplete
This is the Main Menu for the Aircraft Characteristics lesson.
The specific characteristics and capabilities of both Intertheater and Intratheater Airlift aircraft will be discussed.

UMO - AIR OPNS

Senior Transportation Officer Qualification Course
Aircraft Characteristics

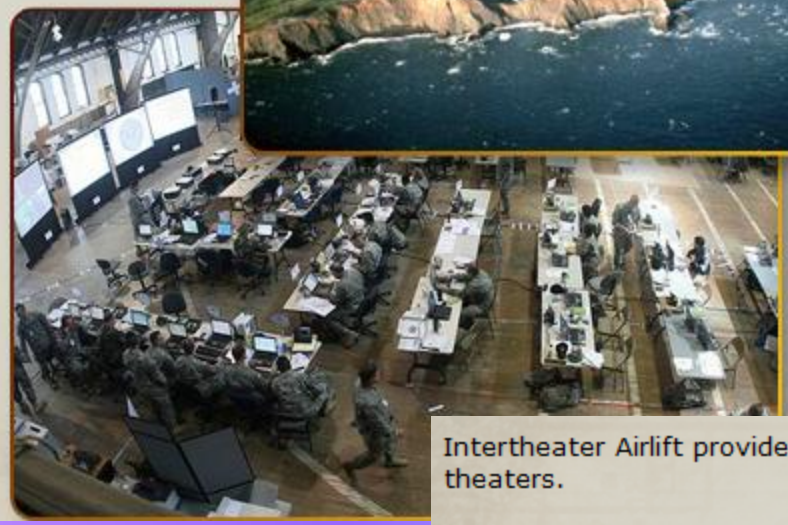
Intertheater Airlift Determination

During deployment operations, Intertheater Airlift requirements, while significant, are to a large degree predictable.

Such requirements normally are identified in the Time-Phased Force and Deployment Data (TPFDD) associated with a particular Operation Plan (OPLAN) or Operation Order (OPORD).

The deployment data processed through the Transportation Coordinator's Automated Information for Movement System II (TC-AIMS II) into the Joint Operation Planning and Execution System (JOPES) allows transportation and operational planners to perform a transportation feasibility analysis.

This analysis of an OPLAN's TPFDD determines supportability in terms of the type and amount of strategic lift assets required to accomplish planned movements within specified dates.



Intertheater Airlift provides the critical link between theaters.

The TPFDD is both a force and a transportation requirements document that is created after the geographic combatant commander prepares a Course of Action in response to a tasking from the Chairman, Joint Chiefs of Staff.

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Intertheater

Intertheater Airlift is the common-user airlift linking theaters to the continental United States and to other theaters, as well as the airlift within the continental United States.

The majority of these air mobility assets is assigned to the Commander, United States Transportation Command (USTRANSCOM).

Because of the intertheater ranges usually involved, intertheater airlift is normally conducted by the heavy, longer range, intercontinental airlift assets but may be augmented with shorter range aircraft when required.

Formerly referred to as "strategic airlift" (JP 1-02. SOURCE: JP 3-17).

TPFDD

Time-Phased Force and Deployment Data (TPFDD) is the Joint Operation Planning and Execution System (JOPES) data-based portion of the operational plan.

It contains time-phased force data, non-unit related cargo and personnel data, and movement data for the operational plan including:

- In-place units.
- Units to be deployed to the joint operational area with a priority indicating the desired sequence for their arrival at the Port of Debarkation (POD).
- Routing of forces deployed.
- Movement data associated with deploying forces.
- Estimates of non-unit related cargo and personnel movements to be conducted concurrently with the deployment of forces.
- Estimates of transportation requirements, which are fulfilled by common user lift resources, as well as those requirements that can be fulfilled by assigned or attached transportation resources.

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Aircraft Characteristics

Basic Airlift Missions

The basic mission of airlift is passenger and cargo movement.

This includes:

- Combat Employment and Sustainment
- Aeromedical Evacuation
- Special Operations Support
- Operational Support Airlift

The basic mission of airlift is passenger and cargo movement. This includes Combat Employment and Sustainment, Aeromedical Evacuation, Special Operations Support, and Operational Support Airlift.

The United States Transportation Command airlift system has the flexibility to surge and meet requirements that exceed routine, peacetime demands for passenger and cargo movement.

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Aircraft Characteristics

C-5 Galaxy

Until the introduction of the Russian An-124 Condor (1982), the C-5 Galaxy was the largest and heaviest aircraft in the world.

The gigantic C-5 Galaxy, with its tremendous payload capability, provides the Air Mobility Command (AMC) Intertheater Airlift as part of the strategic airlift concept.

The most dramatic display of the Galaxy's capability and value was during operations Desert Shield and Desert Storm. C-5 Galaxies comprised only 12 percent of the combined airlift fleet, yet they carried 44 percent of all airlift cargo and flew 23 percent of all strategic airlift missions.

The strategic airlift to the Persian Gulf was the largest since World War II. By the cease-fire, C-5s had moved 482,000 passengers and 513,000 tons of cargo.

NOTE:
The C-5 only carries passengers or troops in the lower-deck cargo compartment during emergency operations or on special missions authorized by Headquarte

The C-5, in its several variations, is one of the largest aircraft in the world and the largest airlifter in the Air Force inventory.

It has the ability to carry 36 standard pallets and up to 81 troops simultaneously. There are presently four variations of the C-5 deployed world-wide.

The C-5 Galaxy was the first transport aircraft to incorporate in-flight refueling capability as an original design feature.

The ability to aerial refuel allows the aircraft to stay airborne indefinitely. With aerial refueling, crew endurance is the only limit to the aircraft's range. (Relief crews are carried on long flights to minimize the crew fatigue factor.)

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Deployed

The present deployed C-5 airlift inventory is:

- C-5A, 59
- C-5B, 47
- C-5C, 2
- C-5M, 3

Total force: 111 aircraft

Characteristics

The general characteristics of the C-5 Galaxy are as follows:

- Primary Function: Outsize cargo transport
- Prime Contractor: Lockheed-Georgia Co.
- Power Plant: Four General Electric TF-39 engines
- Thrust: 43,000 lbs, each engine
- Wingspan: 222.9 ft (67.89 m)
- Length: 247.1 ft (75.3 m)
- Height: 65.1 ft (19.84 m)
- Cargo Compartment: height, 13.5 ft (4.11 m); width, 19 ft (5.79 m); length, 143 ft, 9 in (43.8 m)
- Pallet Positions: 36
- Maximum Cargo: 270,000 lbs (122,472 kg)
- Maximum Takeoff Weight: C-5B 769,000 lbs (348,818 kg) (peacetime), 840,000 lbs (381,024 kg) (wartime)
- Speed: 518 mph (.77 Mach)
- Range: 6,320 nm (empty)
- Crew: 7 (pilot, co-pilot, two flight engineers, and three loadmasters)

Features

The C-5 can carry outsize and oversize cargo intercontinental ranges and can take off or land in relatively short distances. Ground crews can load and off load the C-5 simultaneously at the front and rear cargo openings. Other features of the C-5 include:

- Able to take off fully loaded within 8,300 ft (2,530 m) and land within 4,900 ft (1,493 m).
- High flotation landing gear with 28 wheels sharing the weight.
- Nose and aft doors that open the full width and height of the cargo area to permit faster loading.
- A unique "kneeling" landing gear system that permits lowering of the parked aircraft so the cargo floor is at truckbed height or to facilitate vehicle loading and unloading.
- Full width drive-on ramps at each end for loading double rows of vehicles.
- A system that records and analyzes information and detects malfunctions in more than 800 points.
- Aircraft has the distinctive high T-tail, 25-degree wing sweep, and four turbofan engines mounted on pylons beneath the wings.
- Carries nearly all of the Army's combat equipment, including such bulky items as its 74-ton mobile scissors bridge, from the United States to any theater of combat on the globe.

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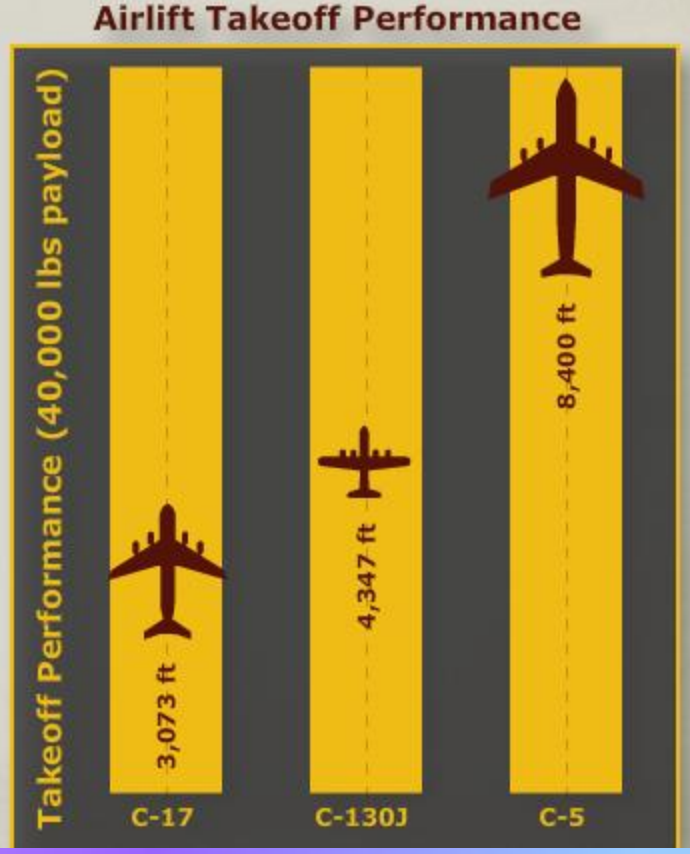
Aircraft Characteristics

C-17 Globemaster III

The C-17 Globemaster III is the newest, most flexible cargo aircraft to enter the airlift force. The C-17 can carry virtually all of the Army's air-transportable equipment.

The design of the cargo compartment allows the C-17 to carry a wide range of vehicles, palleted cargo, para-troops, airdrop loads, humanitarian relief, and aeromedical evacuees.

The design of the aircraft enables it to operate through small, austere airfields. The C-17 can take off and land on runways as short as 3,000 ft (914 m) and as narrow as 90 ft (27.4 m) wide.



The C-17 Globemaster III aircraft can perform strategic, operational, tactical, and airdrop missions, and can also transport litters and ambulatory patients during aeromedical evacuations when required.

The C-17 has proven in-service operational utility, performance, versatility, and reliability, having logged more than 1.8 million flight hours.

Its flexible and multiple cargo configurations makes it a good candidate to also support Humanitarian operations.

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Deployed

Airlift Takeoff Performance

The present deployed C-17 airlift inventory: Total force: 205 C-17s delivered to the USAF as of September, 2010.

Features

Airlift Takeoff Performance

The C-17's ability to fly long distances and land in remote airfields in rough, land-locked regions make it a premier transporter for military, humanitarian, and peacekeeping missions.

It can:

- Take off from a 7,600-ft airfield, carry a payload of 160,000 lbs, fly 2,400 nm, refuel while in flight and land in 3,000 ft or less on a small unpaved or paved airfield in day or night.
- Carry a cargo of wheeled U.S. Army vehicles in two side-by-side rows, including the U.S. Army's main battle tank, the M-1. Three Bradley infantry-fighting vehicles comprise one load.
- Drop a single 60,000-lb payload, with sequential load drops of 110,000 lbs.
- Back up a two-percent slope.
- Seat 54 on the sidewall and 48 in the centerline.

Characteristics

Airlift Takeoff Performance

The general characteristics of the C-17 Globemaster III are as follows:

- Primary Function: Cargo and troop transport.
- Prime Contractor: Boeing Company.
- Power Plant: Four Pratt & Whitney F117-PW-100 turbofan engines.
- Thrust: 40,440 lbs, each engine.
- Wingspan: 169 ft 10 in (to winglet tips) (51.75 m).
- Length: 174 ft (53 m).
- Height: 55 ft 1 in (16.79 m).
- Cargo Compartment: length, 88 ft (26.82 m); width, 18 ft (5.48 m); height, 12 ft 4 in (3.76 m).
- Speed: 450 knots at 28,000 ft (8,534 m) (Mach .76).
- Service Ceiling: 45,000 ft at cruising speed (13,716 m).
- Range: Global with in-flight refueling.
- Crew: Three (two pilots and one loadmaster).
- Aeromedical Evacuation Crew: A basic crew of five (two flight nurses and three medical technicians) is added for aeromedical evacuation missions. Medical crew may be altered as required.
- Maximum Peacetime Takeoff Weight: 585,000 lbs (265,352 kg).
- Load: 102 troops/paratroops; 36 litter and 54 ambulatory patients and attendants; 170,900 lbs (77,519 kg) of cargo (18 pallet positions).

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Aircraft Characteristics

Civil Reserve Air Fleet

The Civil Reserve Air Fleet (CRAF) supports Department of Defense (DoD) airlift requirements in emergencies when the need for airlift exceeds the capability of the military aircraft fleet.

The CRAF has three main segments: international, national, and aeromedical evacuation.

The U.S. Transportation Command (TRANSCOM) commander, with approval of the Secretary of Defense, is the activation authority for all three stages of CRAF.

CRAF can provide 50% of the Air Mobility Command's (AMC's) total strategic airlift capability, and 24% of its total cargo lift capability.

During a crisis, if the AMC has a need for additional aircraft, it would request the TRANSCOM commander to take steps to activate the appropriate CRAF stage.

The Civil Reserve Air Fleet presents benefits and opportunities for both DoD and U.S. airlines. By all accounts it appears to be a symbiotic relationship.

For a very small cost, the Department of Defense has on call a very substantial airlift capacity.

In time of crisis, the Civil Reserve Air Fleet will carry almost 95 percent of the passenger airlift requirements.

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Aircraft Characteristics

KC-10A Extender

The **KC-10A Extender** is an Air Mobility Command advanced tanker and cargo aircraft designed to provide increased global mobility for U.S. armed forces.

Although the KC-10A's primary mission is aerial refueling, it can combine the tasks of a tanker and cargo aircraft by refueling fighters and simultaneously carry the fighter support personnel and equipment on overseas deployments.

The KC-10 has three large fuel tanks under the cargo floor as well as three main wing fuel tanks.

Combined, the six tanks carry more than 356,000 pounds of fuel, almost twice as much as the KC-135 Stratotanker.

Based on a modified McDonnell Douglas DC-10 Series Convertible Freighter, the KC-10A entered service as the critical enabler of long-range airlift missions requiring refueling in flight.

Although it retains 88 percent systems commonality with the DC-10, it has additional systems and equipment necessary for its Air Force mission.

These additions include military avionics, aerial refueling boom, hose and drogue, seated aerial refueling operator station, aerial refueling receptacle, and satellite communications.

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Specifications

Accommodation: Crew, four (pilot, co-pilot, flight engineer, and boom operator)

Dimensions: Height at tail: 58 ft (17.86 m), Length 120 ft (36.64 m), Wingspan 165 ft (50.38 m)

Weights: Max Weight as tanker 240,065 lbs (108.892 kg)Fuel carrying capacity: 356,000 lbs (160,200 kg) of fuel

Cargo: For cargo-handling, the KC-10 is equipped with a large, upward-hinging cargo door. The cargo compartment can accommodate loads ranging from 27 pallets to a mix of 17 pallets and 75 passengers.

Engine/s Performance: Total 3 engine Thrust is 157,500 lbs

Performance: Ceiling 42,000 ft (12.800 m), Max Range with cargo 4.400 miles (3,823 nm; 7,037 km), Top Speed 619 mph (Mach 0.83)

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Aircraft Characteristics

Key Points

The following Intertheater airlift issues and various aircraft platforms were discussed:

KEY POINTS

- Basic Airlift Missions
- The C-5 Galaxy
- The C-17 Globemaster III
- The Civil Reserve Air Fleet (CRAF)
- The KC-10A Extender

The following Intertheater airlift issues and various aircraft platforms were discussed: Basic Airlift Missions, the C-5 Galaxy, the C-17 Globemaster III, the Civil Reserve Air Fleet (CRAF), and the KC-10A Extender.

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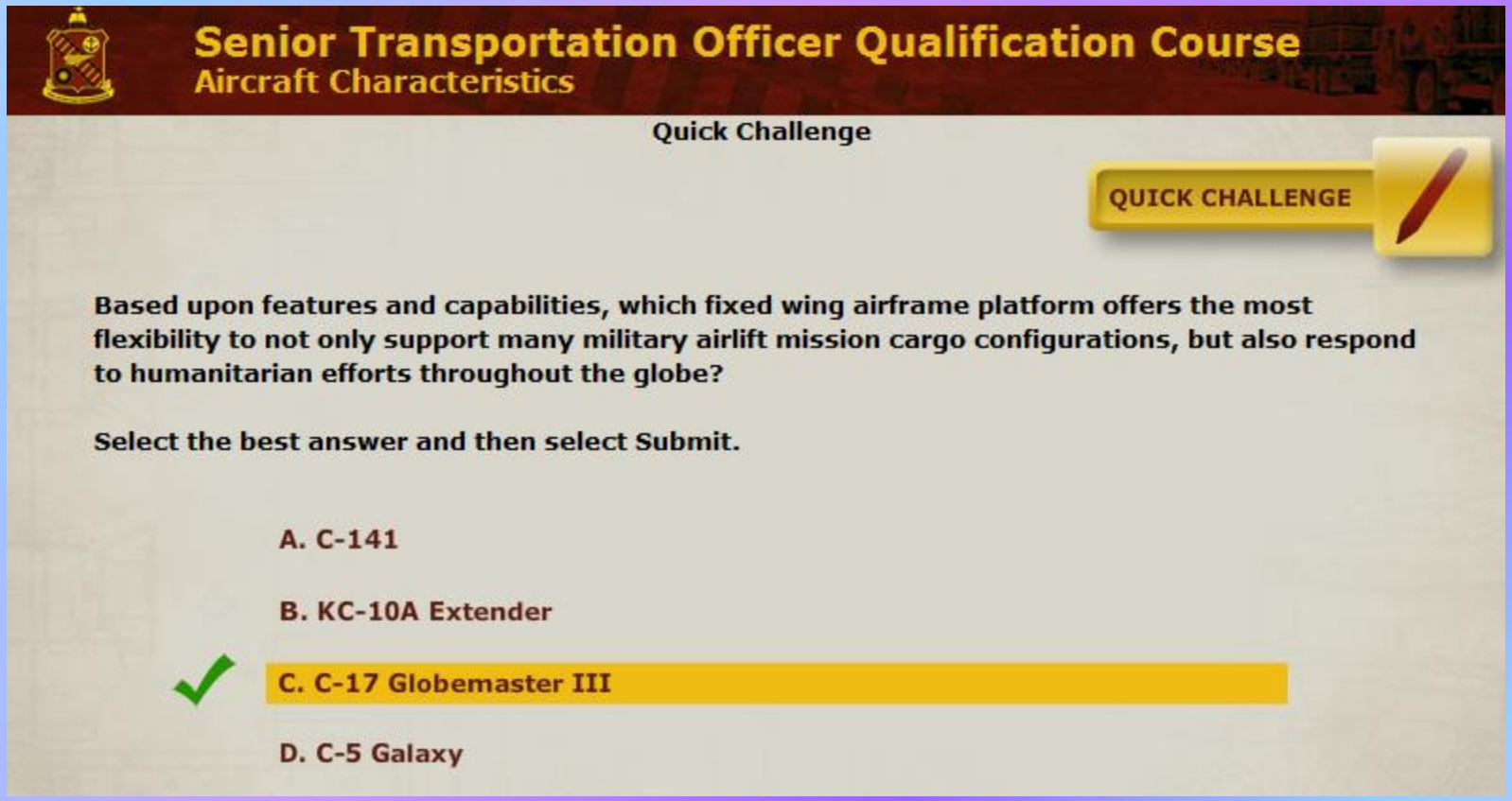
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Aircraft Characteristics
Quick Challenge
QUICK CHALLENGE
Based upon features and capabilities, which fixed wing airframe platform offers the most flexibility to not only support many military airlift mission cargo configurations, but also respond to humanitarian efforts throughout the globe?
Select the best answer and then select Submit.
A. C-141
B. KC-10A Extender
C. C-17 Globemaster III
D. C-5 Galaxy

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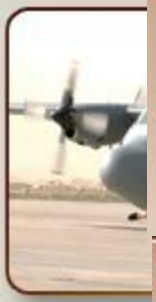
Aircraft Characteristics

Intertheater Airlift requirements include TPFDD force movements and the continuation of sustainment movements arriving in the theater, as well as on-demand movements and routinely scheduled airlift missions for the movement of non-unit related cargo and personnel.

Assets assigned to a geographic combatant commander or attached to a subordinate joint force commander normally conduct Intratheater Airlift operations.

Intratheater Airlift provides air movement and delivery of personnel and equipment directly into objective areas through air landing, airdrop, extraction, or other delivery techniques, as well as the air logistics support of all theater forces, including those engaged in combat operations, to meet specific theater objectives and requirements.

Intratheater Airlift Determinations



Robert McMahon
U.S. Air Force Major General

"In a perfect world, all intratheater airlift moves could be accomplished utilizing our i-channel system that I talked about previously. Now, the reality is that every day there's a myriad of requirements that bubble up that necessitate a unique intra-airlift request be generated.

"There's a myriad of reasons that happens, but include that a warfighter needs delivery of passengers or cargo on a specified day, and can't wait for the next scheduled flight.

"War cargo and passengers may have a very special priority that requires a unique mission. Or when the movement becomes our highest priority and can't wait for its scheduled flight, we utilize ITARS.

"And this applies, most importantly, to the movement of our fallen heroes. In any given month, approximately 75 percent of our intratheater airlift movements are accomplished by way of the ITARS system."

Airlift conducted within a theater is referred to as Intratheather Airlift. In theory, almost any aircraft could contribute to the intratheater effort.

In practice, however, the bulk of intratheater missions are normally done by fixed-wing aircraft provided by the Air Force component, while some limited or specialized missions may be accomplished by fixed and rotary-wing aircraft provided by other Services.

Intratheater Airlift Request System

The Intratheater Airlift Request System (ITARS) supports the automated submission and validation of intratheater non time phased force deployment data airlift requirements by theater deployment and distribution operations center personnel.

The automated capability that ITARS brings to the fight, replaces a manually intensive, error-prone process, resulting in significant improvements in efficiency and accuracy.

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Aircraft Characteristics

C-130J Super Hercules

The C-130 airframe operates throughout the U.S. Air Force, serving with Air Mobility Command (stateside based), Air Force Special Operations Command, theater commands, Air National Guard and the Air Force Reserve Command, fulfilling a wide range of operational missions in both peace and war situations.

The Lockheed Martin C-130 J30 Super Hercules is the latest update of the venerable C-130 Hercules family, a four-engine turboprop military transport tactical airlifter.

The standard C-130J has essentially the same dimensions as the C-130E/H variants, but the stretched J-30 version added 15 ft.

The C-130J incorporates state-of-the-art technology to reduce manpower requirements, lower operating and support costs, and provides life-cycle cost savings over earlier C-130 models.

The C-130 Hercules airframe has the longest, continuous production run of any military aircraft in history.

The C-130J is the newest version of the Hercules and the only model still in production.

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Specifications

Crew: three (two pilots and a loadmaster)
Length: 112 ft 9 in
Height: 38 ft 9 in
Width: 10 ft 3 in
Wingspan: 132 ft 7 in (40.38 m)
Horizontal tail span: 52 ft 8 in (6.05 m)
Power Plant: Four turboprop engines w/6-blade composite propellers
Maximum take-off weight (MTOW): 164,000 lbs (74,389 kg)
Maximum payload: 48,000 lbs (21,772 kg)
Maximum cruise speed: 355 KTAS (660 km / hr)
Landing/take-off ground roll: (typical assault mission) 1,500 ft (457 m)
Range with 35,000 lbs cargo: 2,900 nm
Cargo compartment length: 55 ft (15 ft longer than the C-130J-Short)

Cargo Capacity

The various cargo capacities based on mission type are:

- 8 pallets
- 97 litters
- 24 Container Delivery System (CDS) bundles
- 128 combat troops
- 92 paratroops

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Aircraft Characteristics

C-27J Spartan

In June 2007, the C-27J Spartan was chosen as the U.S. Army / Air Force new joint cargo aircraft (JCA).

The C-27J Spartan has the same logistical and maintenance characteristics of the Lockheed Martin C-130J Hercules medium tactical airlifter, and also shares commonality of the cargo capacity.

The primary roles of the C-27J Spartan are cargo transport, troop transport, and material and paratroop air drop.

Other missions include maritime patrol, tactical operations, medical evacuation, ground refueling, fire-fighting, and aerial spraying.

The C-27J Spartan is a tactical transport aircraft.

The aircraft's propulsion system allows the C-27J Spartan to access a wide range of airfields, including short, unprepared strips in hot-and-high altitude conditions, while transporting heavy loads.

Specifications

Crew: Three (pilot, co-pilot and loadmaster)
Capacity: 60 troops / 46 paratroops / 36 litters with six medical personnel
Length: 74 ft 6 in (22.7m)
Wingspan: 94 ft 2 in (28.7 m)
Height: 31 ft 8 in (9.6 m)
Wing Area: 31 ft 8 in (9.6 m)
Weights: Empty Weight: 37,479 lbs (17,000 kg)
Maximum Take-Off Weight: 67,240 lbs (30,500 kg)
Payload: 25,353 lbs (11,500 kg)
Engines: 2 Rolls-Royce AE2100-D2A turboprops
Fuel Capacity: 3,255 lbs (12,320 kg)
Maximum Take-Off Weight: 30,000 kg
Take-Off Ground Run: Under 500 m
Initial Cruise Altitude: 27,500 ft
Range: 1,050 nm
Maximum Cruise Speed: 300 knots
Service Ceiling: 30,000 ft (9,144 m)

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Aircraft Characteristics

C-23 Sherpa

The C-23 Sherpa is the U.S. Army National Guard's answer to missions requiring an aircraft that is capable of faster, higher-altitude and longer-distance coverage than helicopters.

Its mission is movement of critical troops and supplies in a theater area.

It can do both static line and free-fall para-drop, air medical evacuation, and when properly equipped, serve as a command and control communications platform.

For safety, pilots fly low and fast, racing along at 200 miles per hour, 100 feet above ground or occasionally lower.

"We dodge power lines, we're down there with the helicopters for the most part." said pilot Chief Warrant Officer 4 Dave Smith.

"They needed something in the theater that could do what the Chinook does but with less down time for maintenance. There's nothing in the middle but the C-23. It's a very durable aircraft but it's not built for looks." said Dale Chrisenberry, company maintenance officer.

The C-23 Sherpa is a multi-role utility airplane and it's really the only cargo airplane in the Army.

The C-23 can move quickly around the theater and provide similar supply capabilities as the CH-47 Chinook.

"The Sherpa is the aircraft that can," said Lt. Col. Steven Campfield, commander of the 6th Battalion, 52nd Aviation Regiment, which includes the Sherpa company. "I would say the Sherpa has been the workhorse in this theater."

Specifications

Type: freight/utility transport
Max Speed: 218 mph (190 knots)
Max Range: 225 miles (363 km)
Wingspan: 74 ft 8 in (22.76 m)
Length: 58 ft (17.69 m)
Height: 16 ft 3 in (4.95 m)
Weight (empty) 14,727 lbs (6,680 kg); Max take-off 22,900 lbs (10,387 kg)

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Senior Transportation Officer Qualificatio
Aircraft Characteristics

CH-47 Chinook

The Chinook is the world's most reliable and efficient transport helicopter, capable of handling useful loads up to 24,000 lbs, and a maximum gross weight of up to 50,000 lbs.

The Chinook is a multi-mission, heavy-lift transport helicopter that has been in continuous service since 1962.

Its primary mission is to move troops, artillery, ammunition, fuel, water, barrier materials, supplies, and equipment on the battlefield.

Its secondary missions include medical evacuation, disaster/humanitarian relief, search and rescue, aircraft recovery, fire fighting, parachute drops, heavy construction, and civil development.

Specifications

Crew: three (two pilots and a loadmaster)
Troop seats: 44
Litters (stretchers) 24
Cargo space: cabin provides 42m³ of cargo
21m² of cargo floor area
Length: Fuselage - 52.0 ft. (15.9 m) Incl. Ro
(30.18 m)
Width: 12.42 ft (3.78 m)
Rotor Diameter: 60 ft (18.29 m)
Height: 18.92 ft (5.77 m)
Propulsion: 2 Honeywell 55-GA-714A engine
Speed: 170 knots (315 km/h)
Fuel: 1,034 gal. (3,914 L)
Service Ceiling: 20,000 ft
Useful Load: 24,000 lbs (10, 886 kg)
Mission Radius: 200 nm (370.4 km)
Max Gross Weight: 50,000 lbs (22,668 kg)

The Boeing CH-47 Chinook airframe is a tandem rotor, medium-lift helicopter that meets tactical and combat support mission requirements for military forces around the world.

Over 1,179 Chinooks are operational worldwide and Boeing has delivered more than 480 CH-47D Chinooks to the U.S. Army and National Guard.

Senior Transportation Officer Qualification Course
Aircraft Characteristics

UH-60 Black Hawk

Military or combat support requires moving many troops and tons of equipment to locations where planes or ground-based vehicles often can't reach.

The Black Hawk was designed with these types of logistical missions in mind.

Combining power and an adaptable configuration, the Black Hawk can ferry thousands of pounds of equipment, weapons, and nearly a dozen men to remote locations quickly.

The UH-60 Black Hawk helicopter has been a mainsta of American armed forces since it entered service in 1978.

Its flexible configuration, survivability, and maneuverability make it the medium utility helicopter of choice by military forces around the world.

The U.S. Army has more than 1,740 of these rotary-winged aircraft in different variations.

Specifications

Crew: 2 pilots (flight crew) with 2 crew chiefs/gunners
Capacity: 2,640 lbs of cargo internally, including 14 troops or 6 stretchers, or 8,000 lbs (UH-60A) or 9,000 lbs (UH-60L) of cargo externally
Length: 64 ft 10 in (19.76 m)
Service ceiling: 19,000 ft (5,790 m)
Combat radius: 368 miles (320 nm, 592 km)
Max speed: 185 mph, (296 km/h)
Fuselage width: 7 ft 9 in (2.36 m)
Rotor diameter: 53 ft 8 in (16.36 m)
Height: 16 ft 10 in (5.13 m)
Disc area: 2,260 ft² (210 m²)
Empty weight: 10,624 lbs (4,819 kg)
Loaded weight: 22,000 lbs (9,980 kg)
Max takeoff weight: 23,500 lbs (10,660 kg)
Powerplant: 2× General Electric T700-GE-701C turboshaft

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Senior Transportation Officer Qualification Course
Aircraft Characteristics

Key Points

The following intratheater airlift issues and various aircraft platforms were discussed:

KEY POINTS

- Intratheater Airlift Missions
- The C-130J Super Hercules
- The C-27J Spartan
- The C-23 Sherpa
- Rotary-wing platforms

The following intratheater airlift issues and various aircraft platforms were discussed: Intratheater Airlift Missions, the C-130J Super Hercules, the C-27J Spartan, the C-23 Sherpa, and some rotary-wing platforms in present use.

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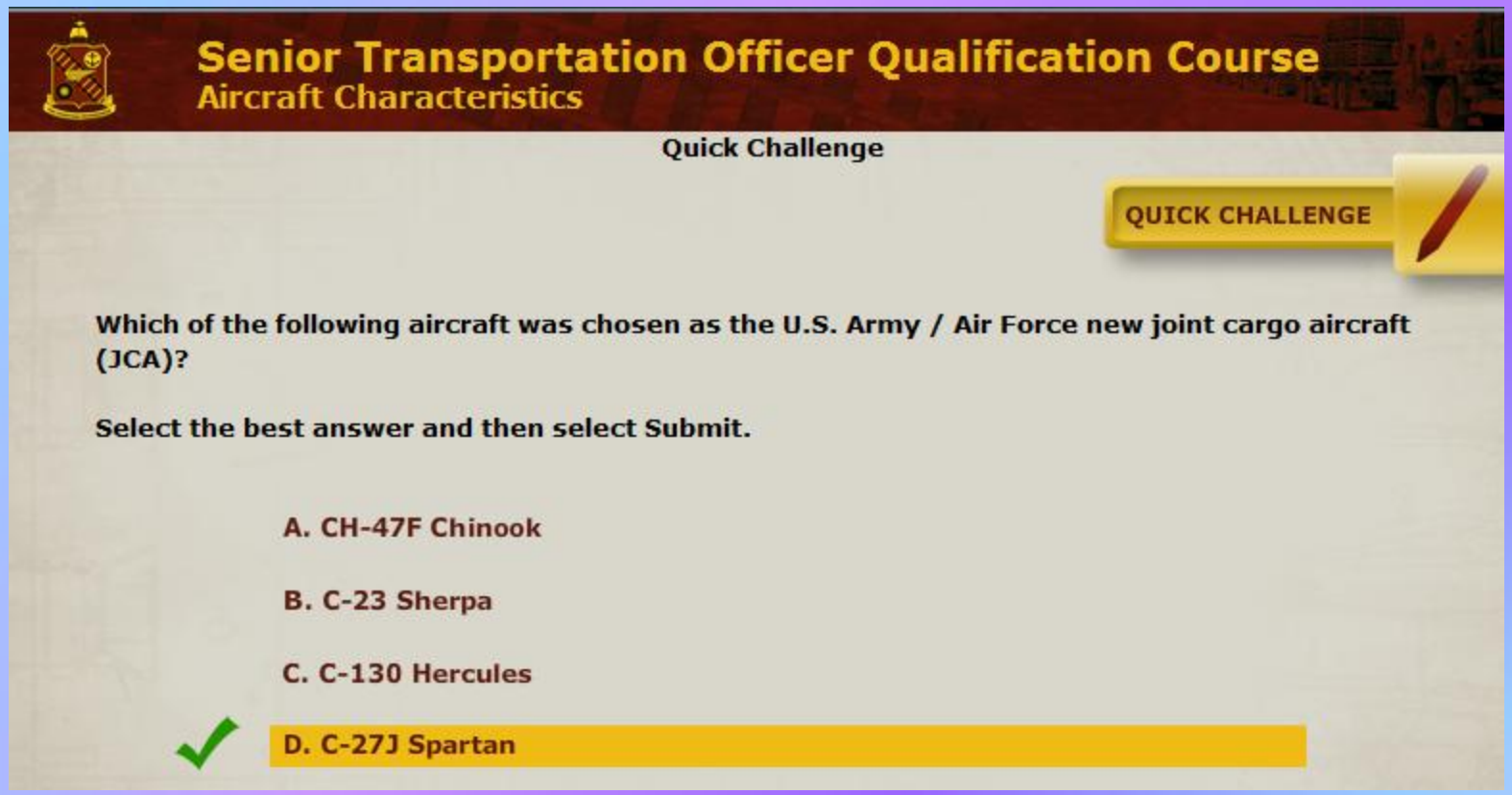
Senior Transportation Officer Qualification Course
Aircraft Characteristics
Quick Challenge
QUICK CHALLENGE
Which of the following aircraft was chosen as the U.S. Army / Air Force new joint cargo aircraft (JCA)?
Select the best answer and then select Submit.
A. CH-47F Chinook
B. C-23 Sherpa
C. C-130 Hercules
D. C-27J Spartan

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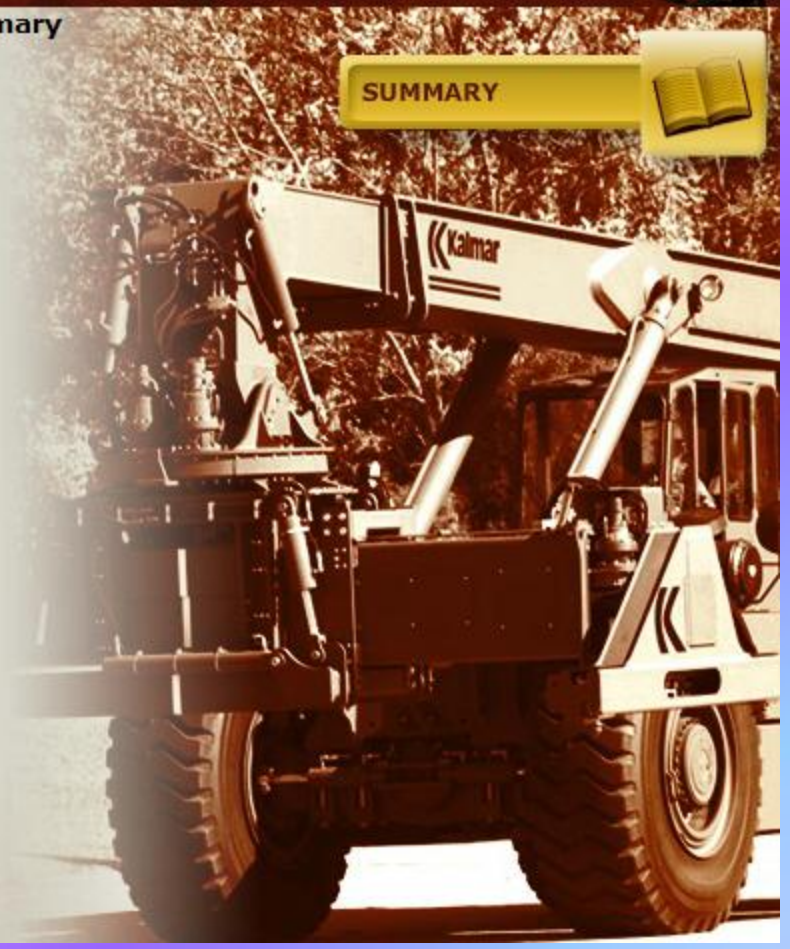
Senior Transportation Officer Qualification Course
Aircraft Characteristics

Summary

In this lesson, you were introduced to the concept of Intertheater and Intratheater airlift missions.

You were also given general characteristics of the airframe platforms that are most commonly deployed to complete these missions.

Your knowledge of these aircraft capabilities will assist you in the logistics planning process, and ensure the proper mode of transportation is chosen for mission accomplishment.



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Motivator

In this lesson, you will learn about the 463L Pallet System.

A working knowledge of this uniquely designed cargo system and how it is utilized, will give you the necessary insights on how best to deploy it.

As a Senior Transportation Officer, your application of this knowledge will help you and others accomplish transport support missions.

In this lesson, you will receive an overview of the 463L Pallet System, the design characteristics, and pallet criteria according to position, weight, and height.

You will also learn the pallet capacity of the various air transport permitted to employ the 463L System.

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463L Pallet System

Lead-in

LEAD-IN

The HCU-6/E or 463L Master Pallet is a standardized pallet used for transporting military air cargo.

Before the development of the Air Force's 463L Materials-Handling System, individual pieces of cargo were floor-loaded by hand.

However, as aircraft grew in size and productivity, cargo-handling and aircraft-loading efficiency were upgraded.

The 463L pallet is the main air-cargo pallet of the United States Air Force (USAF), designed to be loaded and offloaded on today's military airlifters, as well as many civilian Civil Reserve Air Fleet (CRAF) cargo aircraft.

Designed and finalized in the early 1960's from a USAF contract award, the original design of the pallet was configured to mate up to the Universal Cargo Handling Rail System used in C-130 and C-141 aircraft deployed during that time.

Before the development of the Air Force's 463L Materials-Handling System, individual pieces of cargo were floor-loaded by hand.

However, as aircraft grew in size and productivity, cargo-handling and aircraft-loading efficiency were upgraded.

System 463L pallets and nets are essential to the effective use of the military airlift system.

In normal operations, they reduce aircraft ground time and allow for load preplanning.

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463L Pallet System

The 463L Pallet System

In 1957, the USAF adopted a standardized system to facilitate the rapid movement of general cargo aboard airlift aircraft.

This 463L Pallet System encompasses all phases of cargo loading including Material Handling Equipment (MHE), cargo loading platforms, restraint equipment (nets), and in-aircraft systems (aircraft rail/roller systems).

An empty 463L pallet weighs 290 lbs and 355 lbs with nets (three nets to a set: one top net yellow/tan and two side nets green/black).

The 463L Pallet System and nets will restrain up to 10,000 lbs of general cargo 96 inches high.

The side nets attach to the rings of the 463L pallet and the top net attaches by hooks to the rings on the side nets. Nets may be tightened using the adjustment points.

The 463L Pallet System is the Air Force standard for movement of concentrated cargo, is extremely efficient, and can reduce ground times by as much as 75 percent.

Caution

Before using the nets, lay them out and inspect for serviceability.

Do not use nets that are torn, rotten, have loose stitching, or have bad or missing hooks.

Only one bad strap or hook is enough to make the entire net unserviceable.

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463L Pallet System

Rail System

The dual-rail system is installed in all airlift or 463L-capable military aircraft.

This system consists of rows of rollers that allow the palletized cargo to easily move into the aircraft.

Many of these rollers are stowable to convert the cargo deck to a flat, clear loading surface for wheeled cargo.

The side rails guide the pallets into the aircraft and provide lateral and vertical restraint.

These rails are equipped with detent locks that hold the pallet securely in place once inside the aircraft.

These locks also prevent the forward and aft movement of pallets during flight.

The C-130, C-17, and C-5 airframes all engage the notches in the 463L system pallets at the outboard edges by locks in the rail system.

The pallet edges are equipped with rails that are indented every 10 inches on center, thereby permitting an interface with the locks in the aircraft-restraint rails.

The military rail system provides a means of guiding and final positioning of pallets within the aircraft, locking the pallets in place for restraint. It is also a key to mass airdrop procedures.

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463L Pallet System

General Data

463L pallet General Data is as follows:

- Pallet Dimensions:
  - Width: 108 in
  - Length: 88 in
  - Height: 2 1/4 in
- Pallet Usable Dimensions:
  - Width: 104 in
  - Length: 84 in
- Pallet Weight (empty) 290 lbs
- Weight of Nets (side and top) 65 lbs
- Maximum Cargo Weight 10,000 lbs
- Desired Load Capacity 7,500 lbs
- Maximum Gross Weight 10,355 lbs

This screen contains general data on the 463L pallet itself.

One of the functional aspects inherent to the 463L pallet is that when turned sideways, fits on the rollers of the C-130 and other aircraft, and when turned lengthwise, fits on the bed of a truck.

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463L Pallet System

Construction

The 463L pallet is constructed of corrosion-resistant aluminum with a soft wood or fiberglass core, and is framed on all sides by aluminum rails.

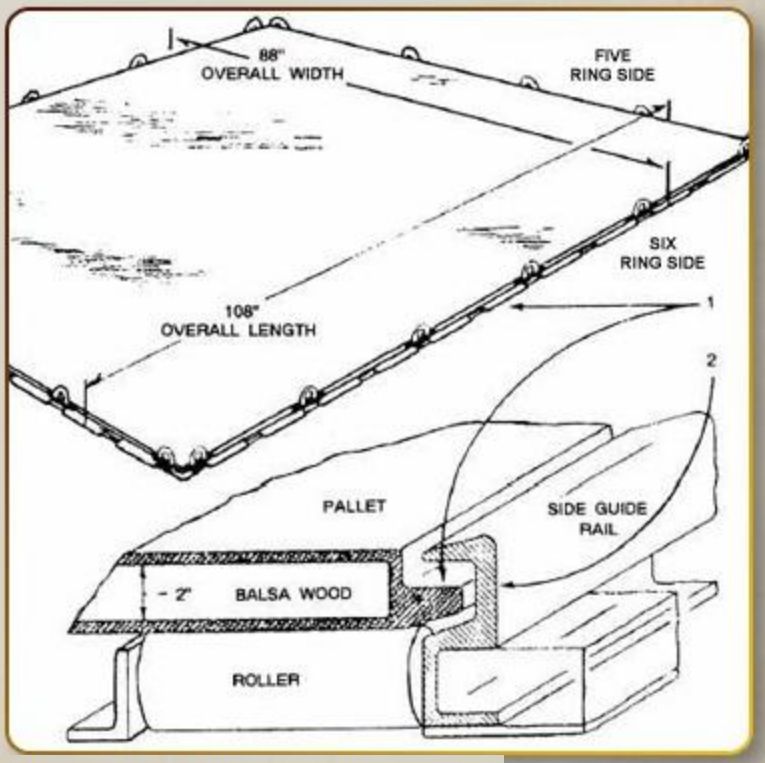
The rails have 22 tie-down rings attached with six rings on each long side and five rings on each short side. Each ring has a 7,500 lb restraint capacity.

The rails also have indents (notches) that accept the detent locks located on numerous types of materials-handling equipment and on all airlift-capable aircraft.

The overall dimensions of the 463L pallet are 108 inches long by 88 inches wide by 2 1/4 inches thick.

However, the usable dimensions of the upper surface are 104 inches long by 84 inches wide. This allows 2 inches around the periphery of the pallet to attach straps, nets, or other restraint devices.

An empty 463L pallet weighs 290 lbs (355 lbs with a complete set of nets) and has a maximum load capacity of 10,000 lbs.



The 463L pallet itself is made of aluminum skin with a wood or fiberglass core and is framed on all sides by aluminum rails.

The rails have 22 tie-down rings attached with six rings on each long side and five rings on each short side.

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463L Pallet System

Pallet Buildup Checklist

The following 463L pallet checklist will help the UMO and unit prepare for deployment:

- Have safety practices, protective gear usage, and proper lifting techniques been briefed?
- Is the pallet skin free of damage, dirt, corrosion, level, and not warped, top and bottom?
- Are there any bent lips on the 88 inch side?
- Does the pallet have 22 serviceable tie-down rings?
- Is the cargo secured to the pallet using two side nets and a top net?
- Is the cargo to be placed on the pallet securely packaged and have required markings?
- Is serviceable dunnage available for pallet build?
- Is hazardous cargo positioned for easy access and labeled? (SFs 400 to 422) Is a DD Form 1387-2 (Special Handling Data/Certification) attached?
- Is the cargo arranged on the pallet to meet the following criteria:
  - Are the heavier boxes and crates placed on the bottom of the pallet load?
  - Is lighter, more fragile cargo placed on top of the pallet load?
  - Is the cargo arranged and properly stacked so that it is stable?
- Is the pallet loaded within rated capacity, useable dimension, and height criteria?

All eyes involved in preparing a 463L pallet for deployment should be able to answer these checklist questions.

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463L Pallet System

Aircraft Accommodations/Restrictions

The normal number of pallet positions that an Air Mobility Command (AMC) aircraft can handle are as follows:

C-130 Hercules
C-17 Globemaster III
C-5 Galaxy

Each aircraft has specific pallet position criteria according to position, weight, and height.

Other airlift, such as KC-10s, KC-135s, DC-8s, and others require the top of the pallet be contoured in order for the pallet to fit in the aircraft.

Each aircraft has specific 463L pallet accommodations and position criteria according to position, weight, and height.

C-130 Pallet Positions

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C-130 Hercules

The C-130 can accommodate up to six 463L pallets. Usable surface dimensions of a 463L pallet are 84 inches long by 104 inches wide. For pallet positions 3 and 4, maintain a 6 inch aisle along the narrow side of the pallet.

Do not exceed an overall dimension of 84 inches long, 98 inches wide, and 96 inches high. This will provide the necessary aisleway for emergency exit of the aircraft.

For pallet position 6, maintain an 18 inch aisle. Pallet cargo dimensions will not exceed 86 inches wide, 84 inches long, and 76 inches high.

This provides access to the latrine, cargo loading aids stowed in the cargo door, and to the aft escape exit hatch on the aft end of the cargo ramp.

C-17 Globemaster III

The C-17 can accommodate up to 18 463L pallets. Pallet position criteria according to position, weight, and height.

Pallet positions 8 and 9, left and right, cannot exceed a combined weight of 40,000 lbs.

All pallets must be rotated 90 degrees while loading/unloading for this configuration.

C-5 Galaxy

The C-5 can accommodate up to 36 463L pallets. Pallet positions 1 and 2 have a maximum weight of 7,500 lbs and require a 14 inch aisleway on the outer edge of the short side.

This will provide the necessary aisleway for emergency exit of the aircraft.

Pallet positions 35 and 36 have a height restriction of 70 inches and a maximum weight of 7,500 lbs and requires a 14 inch aisleway on the outer edge of the short side.

This provides access to the latrine, cargo loading aids stowed in the cargo door, and to the aft escape exit hatch on the aft end of the cargo ramp.

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463L Pallet System

Key Points

The following key points concerning the 463L Pallet System were discussed:

KEY POINTS

- 463L Pallet System general data and construction
- Aircraft Rail System
- Pallet Checklist
- Aircraft accommodations and restrictions

The following key points concerning the 463L Pallet System were discussed: the 463L Pallet System general data and construction, the Aircraft Rail System, the Pallet Checklist, and specific aircraft accommodations and restrictions.

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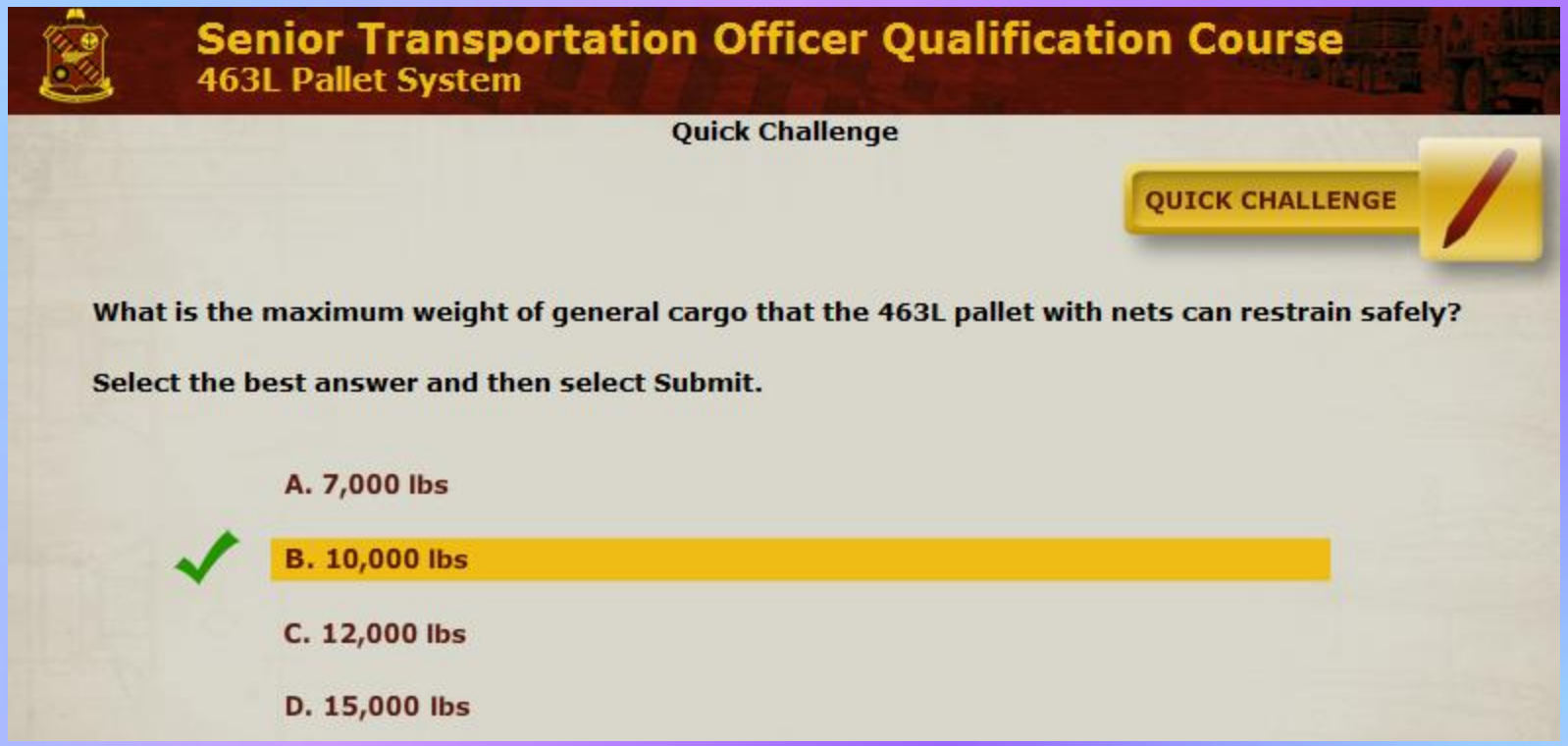
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463L Pallet System
Quick Challenge
QUICK CHALLENGE
What is the maximum weight of general cargo that the 463L pallet with nets can restrain safely?
Select the best answer and then select Submit.
A. 7,000 lbs
B. 10,000 lbs
C. 12,000 lbs
D. 15,000 lbs

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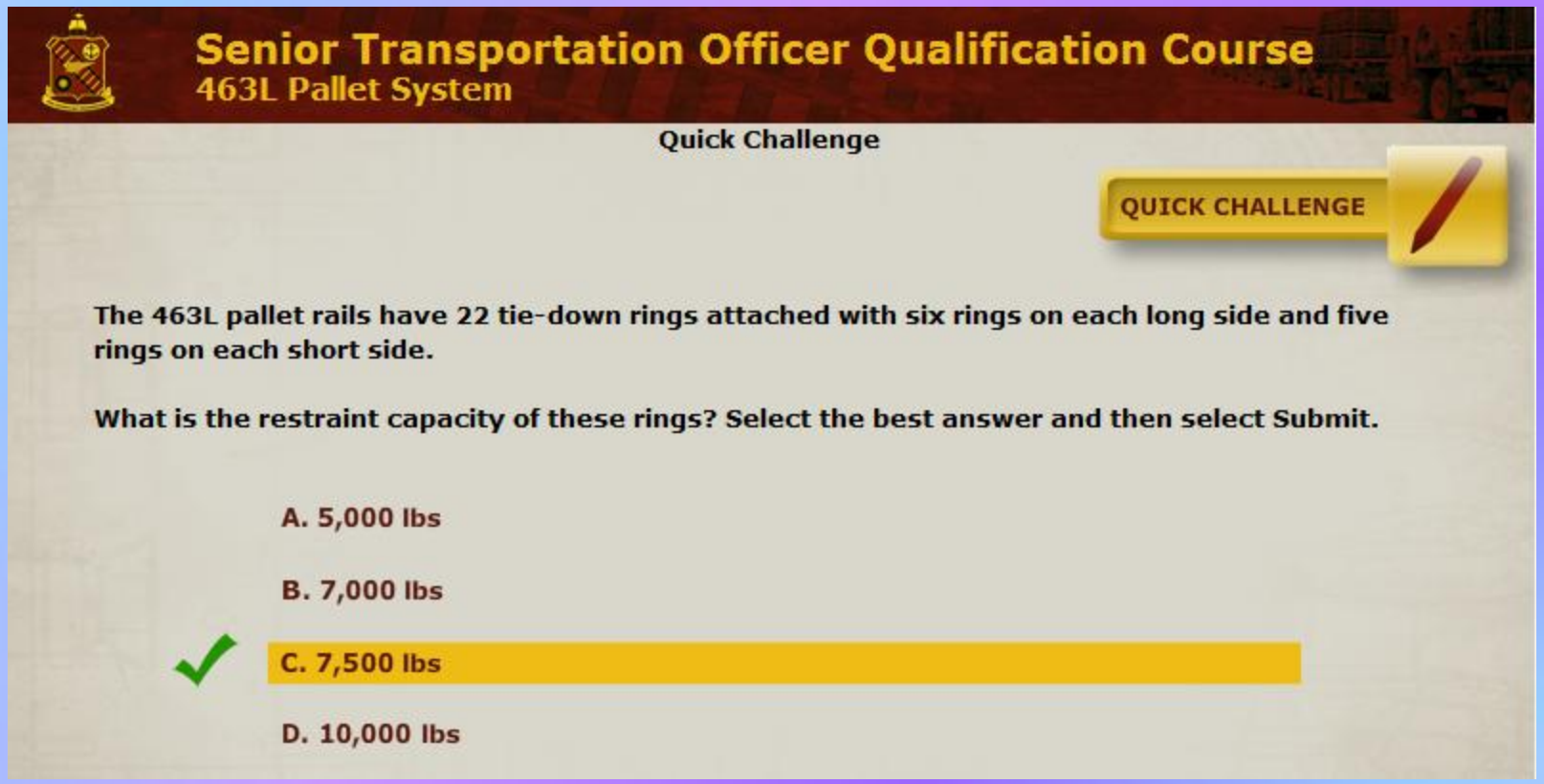
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463L Pallet System
Quick Challenge
QUICK CHALLENGE
The 463L pallet rails have 22 tie-down rings attached with six rings on each long side and five rings on each short side.
What is the restraint capacity of these rings? Select the best answer and then select Submit.
A. 5,000 lbs
B. 7,000 lbs
C. 7,500 lbs
D. 10,000 lbs

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463L Pallet System

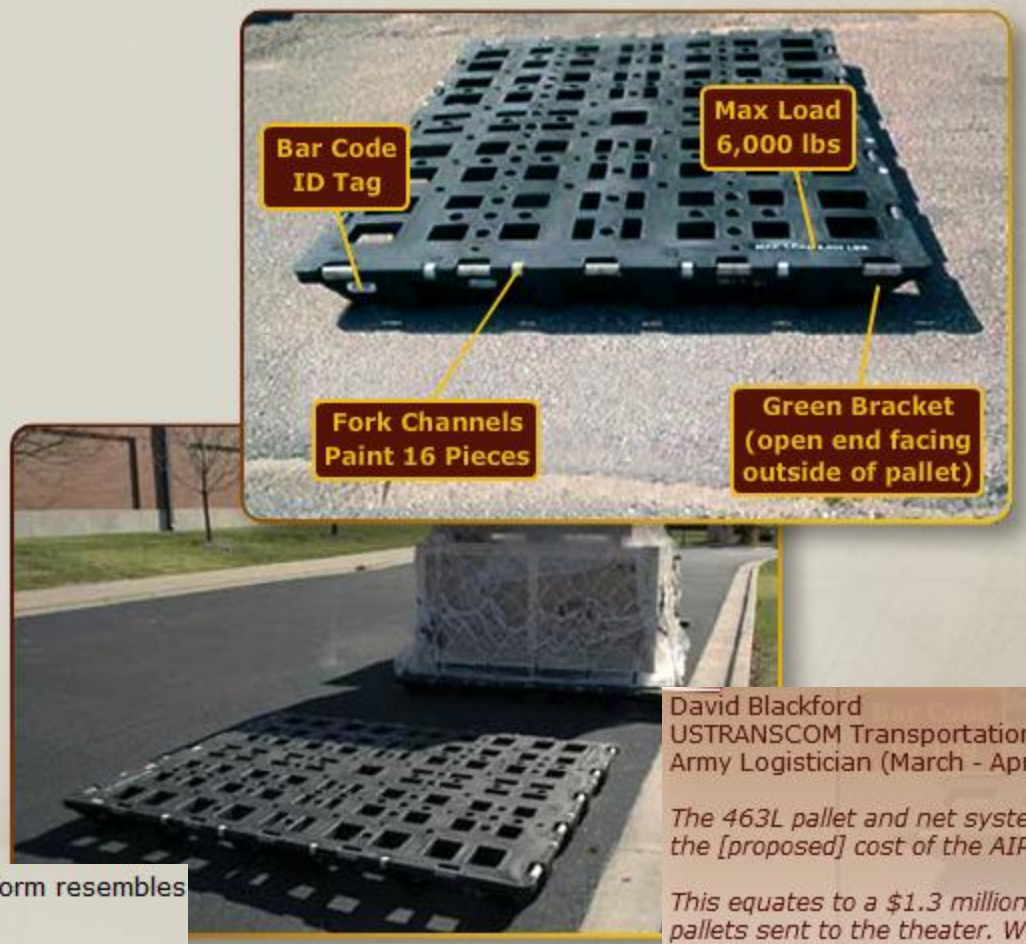
Associate Intermodal Platform

Use of a new "pallet on a pallet" shipping system developed for the U.S. Transportation Command (USTRANSCOM) could save money in shipment costs.

The Associate Intermodal Platform (AIP) system, also referred to as the 463L Sub Pallet Associate Airlift Platform, consists of an 82 inch by 102 inch by 8 inch rectangle made of a linear, low-density hexane copolymer.

Cargo can be loaded onto the AIP, cargo netting attached, and the whole package tied down and loaded onto a 463L pallet for shipment.

The AIP can be used alone or to transport a loaded International Organization for Standardization (ISO) container. Once in theater, the AIP can be offloaded and sent on to its final destination and the 463L pallet returned to the Defense Transportation System (DTS).



The proposed Associate Intermodal Platform resembles a large, black waffle.

Implementation of this system will greatly reduce transport costs and 463L pallet loss, damage, or unauthorized use.

The Air Force is analyzing the cost benefit to determine utility of pursuing further development/implementation.

David Blackford
USTRANSCOM Transportation Specialist
Army Logistician (March - April 2006)

The 463L pallet and net system cost $1,700 per set and the [proposed] cost of the AIP system is $400.

This equates to a $1.3 million cost avoidance per 1,000 pallets sent to the theater. We send several thousand pallets to theater per month.

We created the AIP to keep the 463L assets in the DTS and still meet the COCOM [combatant command] requirements for unitized cargo loads.

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463L Pallet System

Aircraft Unit Load Device

The purpose of the Unit Load Device (ULD) is to enable individual pieces of cargo to be assembled into a standard-size unit to facilitate efficient loading and unloading of aircraft having compatible handling and restraint systems.

ULD's are primarily used on Civil Aircraft Reserve Fleet (CRAF) wide body aircraft under AMC contract.

The ULD is an assembly of components consisting of any of the following:

- Aircraft container
- Aircraft pallet and pallet net
- Aircraft pallet and pallet net over a nonstructural container or igloo

Unit Load Devices and associated accessories are used to restrain baggage and cargo in the holds of wide body aircraft during flight, ensuring that their contents remain in its allocated location irrespective of flight conditions such as turbulence.

It allows a large quantity of cargo to be bundled into a single unit. Since this leads to fewer units to load, it saves ground crews time and effort and helps prevent delayed flights.

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463L Pallet System

HICHS

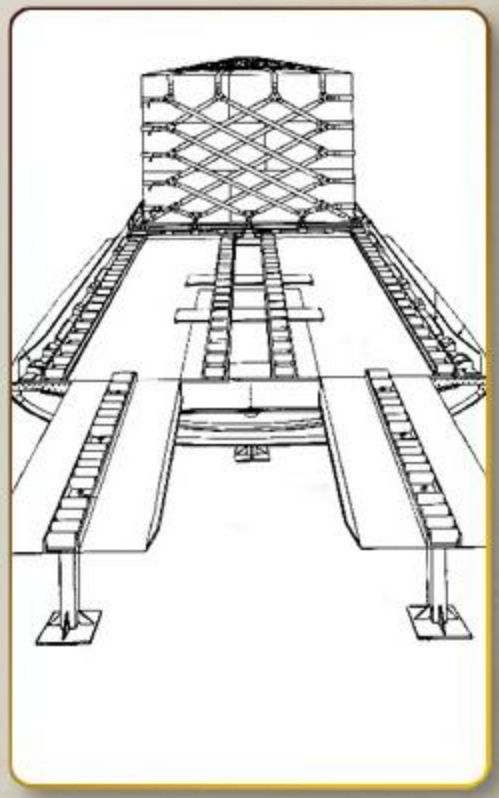
The Helicopter Internal Cargo Handling System (HICHS), designed for use in the CH-47 airframe, allows relatively quick and easy loading of palletized cargo.

Cargo of various types and sizes can be pre-loaded and pre-positioned onto different types of pallets.

The preferred pallet is the 463L, as it does not need to be secured in the cargo compartment utilizing separate tie-down devices.

It slides up into the helicopter and is secured using specially designed locking bars that are an integral part of the HICHS.

The 463L pallet also provides for the fastest off-loading of cargo.



The Helicopter Internal Cargo Handling System provides low-friction, load/unload conveyor ramps, and internal conveyors for moving cargo within the aircraft.

This system consists of three major sections: the cabin/cargo area, ramp section, and the ramp extension section.

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463L Pallet System

JMIDS

The Joint Modular Intermodal Distribution System (JMIDS) is a new transport system that will reduce cost, time expended in man-hours, and possibly replace the 463L Pallet System.

It is comprised of the following three main components: the Joint Modular Intermodal Container (JMIC), the Joint Modular Intermodal Platform (JMIP), and integrated Automatic Identification Technology (AIT), currently an active Radio Frequency Identification (RFID) Tag.

The JMIP is being designed for placement on the logistics rail systems of military aircraft without the need for 463L pallets.

The JMIC is a joint service modular container that is designed to be:

- Stackable and collapsible for storage and retrograde
- Forklift accessible
- For all classes of supply
- Capable of being hauled via sling load by helicopters

JMIDS will provide the military with seamless intermodal connectivity in APOE/APOD, Tactical, Distribution/Sustainment, and Retrograde operations, which will result in cost savings, and faster throughput to the end user.

It is designed to be inserted and extracted directly to and from cargo aircraft by tactical load handling system trucks, eliminating the need for material handling equipment at the airfield.

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463L Pallet System

Key Points

The following key points concerning supporting platforms and development within the logistics community that work with, enhance, or may even replace the 463L Pallet System were discussed:

KEY POINTS

- The Associate Intermodal Platform (AIP)
- The Aircraft Unit Load Device (ULD)
- The Helicopter Internal Cargo Handling System (HICHS)
- The Joint Modular Intermodal Distribution System (JMIDS)

The following key points concerning supporting platforms and development within the logistics community that work with, enhance, or may even replace the 463L Pallet System were discussed: the Associate Intermodal Platform, the Aircraft Unit Load Device, the Helicopter Internal Cargo Handling System, and the Joint Modular Intermodal Distribution System.

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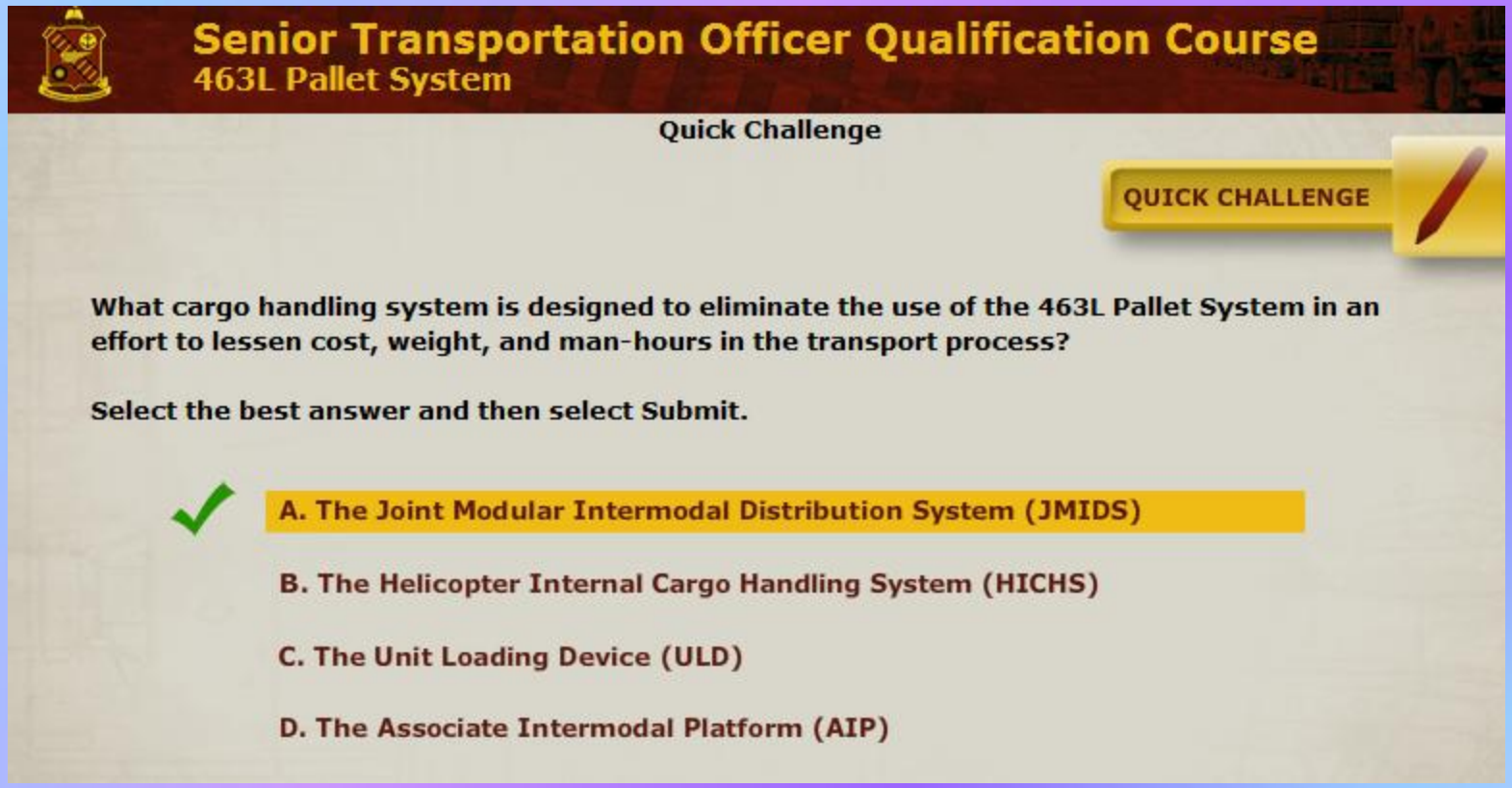
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463L Pallet System
Quick Challenge
QUICK CHALLENGE
What cargo handling system is designed to eliminate the use of the 463L Pallet System in an effort to lessen cost, weight, and man-hours in the transport process?
Select the best answer and then select Submit.
A. The Joint Modular Intermodal Distribution System (JMIDS)
B. The Helicopter Internal Cargo Handling System (HICHS)
C. The Unit Loading Device (ULD)
D. The Associate Intermodal Platform (AIP)

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463L Pallet System

Summary

In this lesson on the 463L Pallet System, you have learned about:

- 463L pallet general and construction data
- The 463L Pallet Buildup Checklist
- Aircraft compatibility to the 463L pallet
- Alternative designs to enhance or replace the 463L pallet

As demonstrated, the logistics community is continually developing and testing new and more efficient methods to transport equipment and supplies to U.S. forces within the operational environment.

Your knowledge of these systems will greatly enhance your ability to support this vital support mission.

In this lesson, you have learned many aspects of the 463L Pallet System, and also learned of various logistics community designs being developed to provide efficient transport of equipment and supplies to the field.

Your knowledge of these systems will greatly enhance your ability to support this vital support mission.

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Determining the Center of Balance

Motivator

To correctly load plan an airlift and segregate loads for individual aircraft, the correct weight and Center of Balance (CB) of cargo units must be determined.

There are two main divisions:

- Vehicles
- General cargo

The accuracy of weight and balance computation is as important to flight safety as proper maintenance.

Items not properly marked will not be accepted for airlift since unknown weight and CB represent an unsafe condition relative to aircraft weight and balance.

In this lesson, you will learn the importance of determining the center of balance to accurately compute the weight and balance condition of a loaded aircraft.

You will also learn the computation formula used to calculate a vehicle or cargo center of balance, and be introduced to a hardware/software system that automatically determines all the dimension, weight, and center of balance factors for load plan development.

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Determining the Center of Balance

Lead-in

LEAD-IN

Each aircraft has a center of balance safety range. Aircraft balance is mainly affected by weight variations along the longitudinal (front to back) axis of the cargo inside the aircraft.

CB refers to the center of balance point of cargo, equipment, and vehicles, required to ensure load balance.

The determination and marking of the Gross Weight (GWT) and CB is usually accomplished at the Inspection/Acceptance Point (IAP), which is usually located within a designated Marshalling Area.

As the Unit Movement Officer, you must know how to calculate the center of balance for your unit's vehicles and equipment.

To keep the cargo weight within the aircraft Center of Gravity (CG) limits, the cargo load center of balance (CB) must be identified.

The combined center of balance (CCB) of the cargo load is then placed in the cargo compartment within a prescribed design limit for the aircraft.

Determining the gross weight and center of balance is an important step in the overall loading process.

The unit shipping the cargo is responsible for marking each item of cargo with the correct gross weight and a center of balance point.

This applies to all cargo items measuring 10 feet or longer and those items that have a center of balance point other than the physical center of the cargo.

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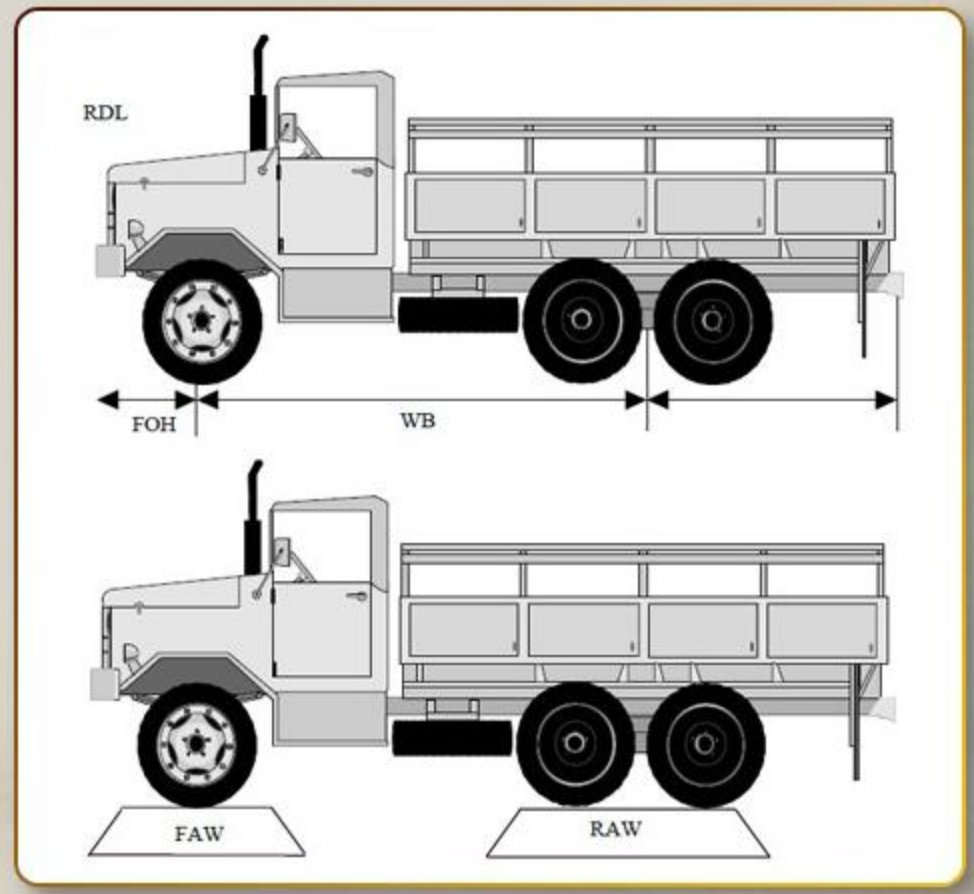
Determining the Center of Balance

Terminology

Center of Balance terms:

- Reference Datum Line (RDL or reference line): Predetermined point where all measurements (in inches) are taken, normally at the forward front edge.
- Front Overhang (FOH): Distance from front bumper to center of front axle.
- Wheel Base (WB): Distance from center of front axle to center of rear axle or center of tandem axles.
- Gross Weight (GWT in lbs): Total weight of cargo, including all secondary loads; found by adding all individual axle weights together.
- Front Axle Weight (FAW in lbs).
- Intermediate Axle Weight (IAW in lbs).
- Rear Axle Weight (RAW in lbs).
- Front Forward Edge (FFE): Distance from most forward edge of vehicle to its CB.
- Moment. The product obtained by multiplying the weight by the distance from the RDL.



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Determining the Center of Balance

Calculation Formula

This is the formula to compute CB to the nearest whole inch.

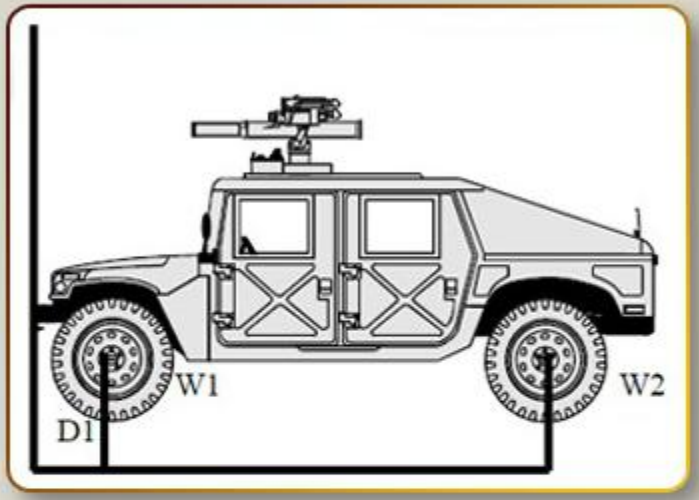
Any answer with a fraction of .5 or higher is increased to next higher number. If .4 or less, drop the number.

Start with measuring the weight and distance for the following:

- W1 = Front axle weight in lbs
- W2 = Intermediate axle weight in lbs
- W3 = Rear axle weight in lbs
- D1 = Distance in inches from FFE to the center of the front axle
- D2 = Distance in inches from FFE to the center of the intermediate axle
- D3 = Distance in inches from FFE to the center of the rear axle

You then place this information into the following formula:

$$\frac{CB = (W1 \times D1) + (W2 \times D2) + (W3 \times D3)}{\text{Total gross weight}}$$



D I from RDL (from forward edge) to center of front axle = 20"
W1 front axle weight = 2,870 lbs
D2 from RDL (from forward edge) to center of rear axle = 150"
W2 rear axle weight = 2,550 lbs

20" x 2,870 = 57,400 moment

150" x 2.550 = 382,500 moment
439,900 total moment

W1 (2,870 lbs) + W2 (2,550 lbs) = Gross Weight (5,420 lbs)
Total Moment (439,900) divided by Gross Weight =
CB (81" from RDL)
[(D1 (20") x W1 (2,870 lbs)] +[(D2 (150" x W2 (2,550 lbs)]
Gross Weight (5,420 lbs) = CB (81" from RDL)

All vehicle-type cargo will have axle weights marked above each axle, on both sides of vehicle, with weather resistant material.

This provides the necessary information anywhere along the deployment process for that specific vehicle.

Vehicle-type cargo with a load-carrying capability will be marked indicating an empty or loaded center of balance.

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Determining the Center of Balance

Detached Trailers

In the case of a detached trailer, you would use the tongue weight as the first axle weight, (In this case, 250 lbs).

Your formula would be the same:

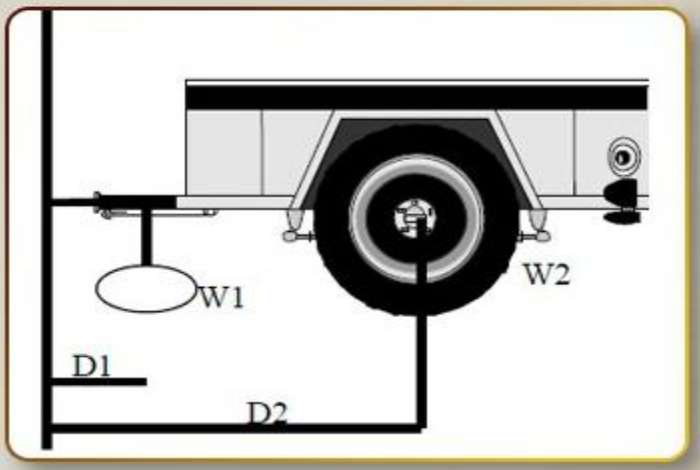
- W1 = 250 lbs
- W2 = 2,250 lbs
- D1 = 15 inches
- D2 = 102 inches

W1 (250 lbs) + W2 (2,250 lbs) = Gross Weight (2,500 lbs)

D1(15") × W1 (250 lbs) = 3,750 + D2 (102") × W2 (2,250 lbs)= 229500 or total moment = 233250
divided by the gross weight of 2,500 lbs

Any answer with a fraction of .5 or higher is increased to next higher number. If .4 or less, drop the number.

CB = 93.3 or 93 inches rounded to the nearest inch



[D1 (15") x W1 (250 lbs)] + [D2 (102") x W2 (2,250 lbs)]

W1 (250 lbs) + W2 (2,250 lbs) = Gross Weight (2,500 lbs) = CB (93" from RDL)

Caution

Determine weight and CB of a vehicle after all secondary cargo is secured for airlift.

Secondary loads are items of baggage or cargo transported in truck beds and trailers, and must be included in the total weight of the vehicle.

Adding to or removing cargo from a weighed and marked vehicle will necessitate reweighing and recomputing the CB.

Trailers and associated prime movers must be individually marked, even if they are connected on the aircraft.

This precludes delays when vehicles must be disconnected or shipped on separate aircraft.

A vehicle's center of balance is computed to the nearest whole inch.

Any answer with a fraction of .5 or higher is increased to next higher number. If .4 or less, drop the number.

After computing the center of balance of a vehicle, mark its location and gross weight on both sides using weather resistant masking tape and grease pencil/magic marker, forming the letter "T".

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Determining the Center of Balance

Center of balance markings are not required on individual 463L pallets (if built correctly, CB will be at or near the center; however, CB markings are required for married pallets [pallet train]).

Mark the CB on all items of cargo that meet the following criteria:

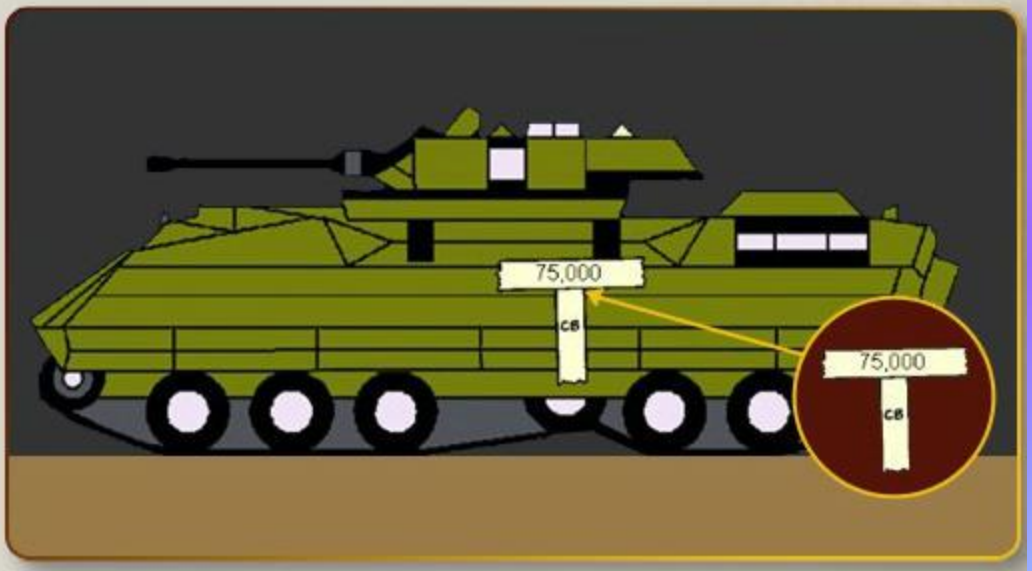
- All vehicles
- Any items of cargo 10 feet or longer
- Any item with a CB point other than its center

For a tracked vehicle, place a log or other similar object that the tracked vehicle can move across on the ground.

The center of balance is the point where the vehicle tips from back to forward. This is the place to put the "T" marker.

Be sure to include the total vehicle weight and the number of inches from the front forward edge (FFE).

CB Criteria



To determine the center of balance for a tracked vehicle, drive the vehicle onto a wooden beam or pole until it tilts forward.

Mark the sides of the vehicle at the point of tilt.

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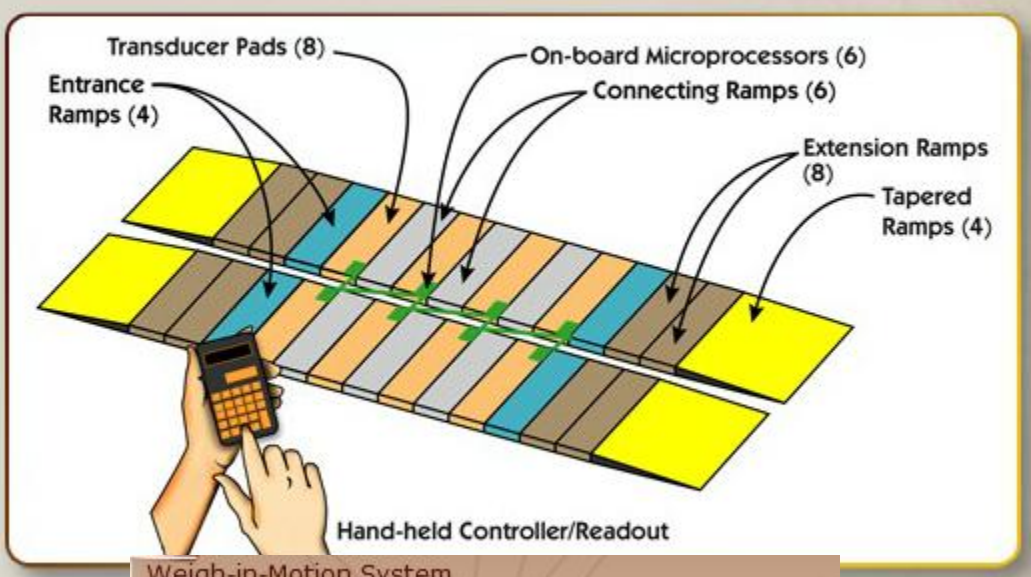
Determining the Center of Balance

Weigh-in-Motion

Weigh-in-Motion (WIM) is a hardware/software combo that determines the individual axle weights, distances between axles, total vehicle weight and center of balance of vehicles at passes of 3 to 6 miles per hour.

It automatically obtains information for the deployment equipment list and sends it to a hand-held device that takes about 10 seconds to compute all the information.

Currently, units use portable individual wheel weight or fixed in-ground static scales, tape measures and calculators to determine vehicle axle weights, total vehicle weight and center of balance for vehicles to be transshipped through railcar, ship, or airlifted in support of military and humanitarian operations.



The process of manually weighing and measuring all vehicles for transshipment operations is time-consuming, labor-intensive, and prone to human errors that can result in safety hazards and inaccurate data.

In rigid areas of operations, scales may not be available at all, and the cargo weight and center of balance must be estimated.

Weigh-in-Motion System
Robert K. Abercrombie, Senior Program Manager
Dave Twitero, Transportation Specialist

"A few years ago, there was a safety incident that ended with a loss of life. Airmen in Afghanistan were changing cargo loads several times during a day in a rural area without a scale.

"They underestimated the weight and center of balance of the loads which caused a plane crash. This is why WIM is very important for the mission of the troops.

"We have a need for this because two Soldiers can do the work of 10, and it cuts the time it takes by one-fifth. A huge movement like 7th Transportation Group can move within one day, versus the five it normally takes."

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Determining the Center of Balance

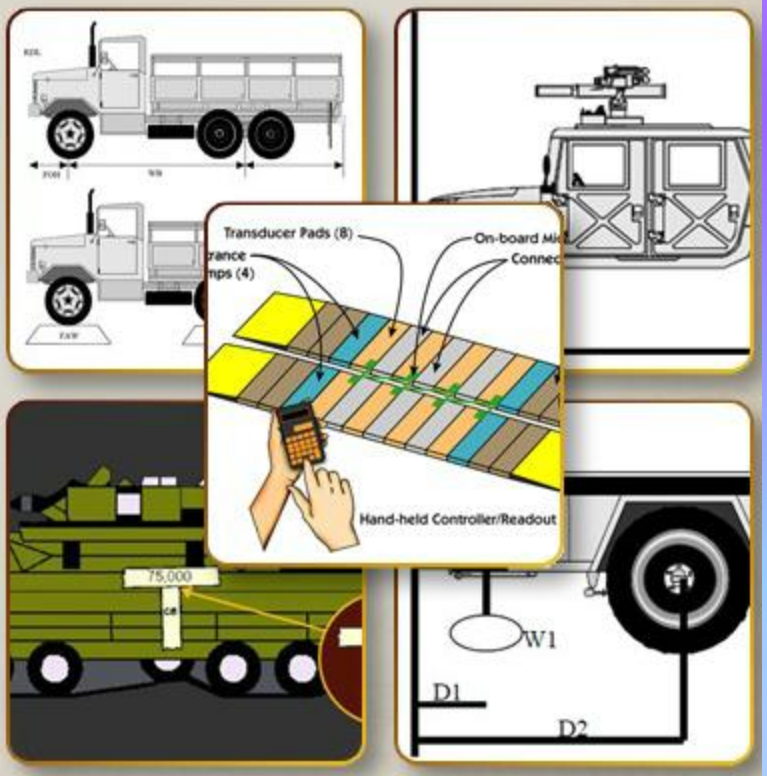
Key Points

The following key points regarding determining center of balance procedures were discussed:

KEY POINTS

- Importance of center of balance
- Terminology
- Calculation formulas and criteria
- The Weigh-in-Motion System

The following key points regarding determining center of balance procedures were discussed: the importance of center of balance, terminology, calculation formulas and criteria, and the Weigh-in-Motion System.



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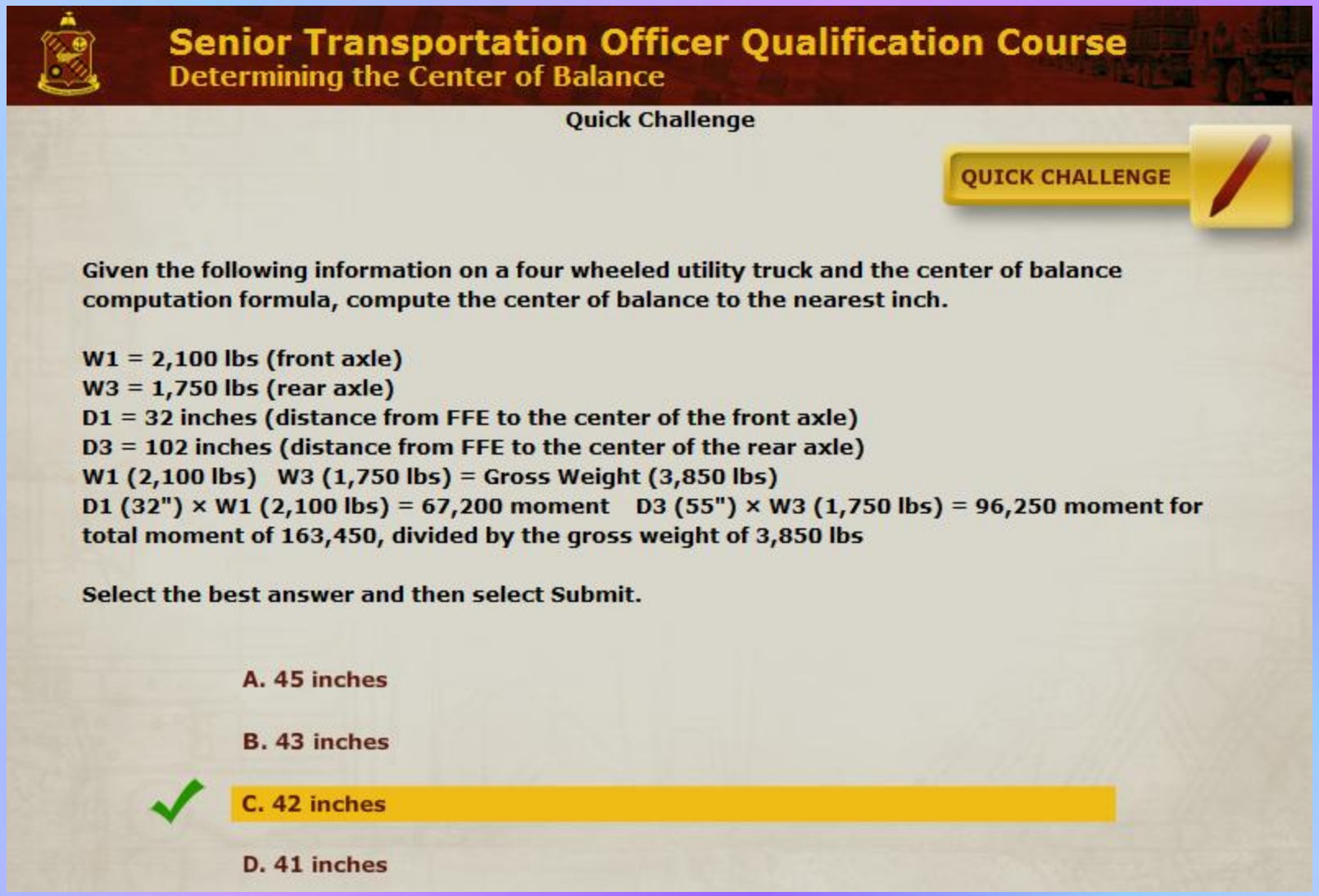

I couldn't get the math to work. Don't have a stroke over this.

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Senior Transportation Officer Qualification Course
Determining the Center of Balance

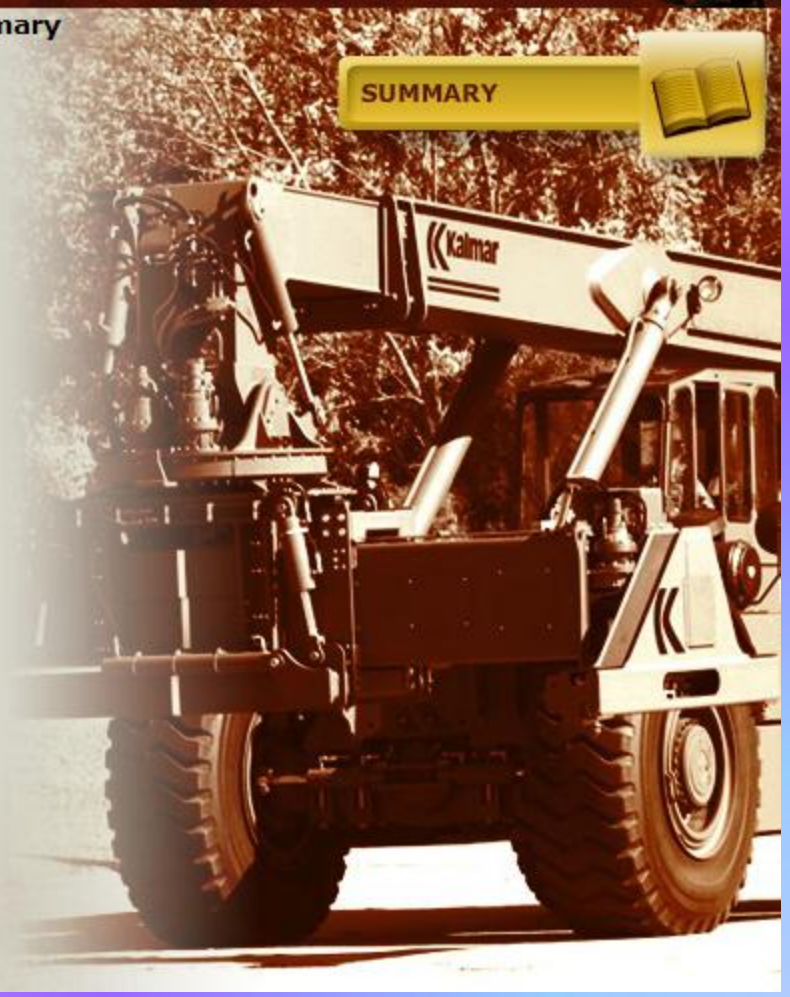
Summary

In this lesson, you have learned about center of balance and the need to accurately establish it for both cargo and unit vehicles when preparing a load plan for airlift.

The ability to manually measure dimensions, weight, and compute the center of balance for cargo and vehicles is essential to ensure aircraft load balance.

New technologies are at the vanguard to assist in reduction of errors and time spent calculating the center of balance.

As a Senior Transportation Officer, you must understand the principles and procedures for determining the center of balance.



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APOD Operations

Motivator

In this lesson, you will learn about arrival activities in the theater at an Aerial Port of Debarkation (APOD).

Reception is the process of expeditiously off-loading, marshalling, and transporting equipment, personnel, and materiel to complete the strategic deployment phase to a sea, air, or surface transportation Port of Debarkation (POD).

Reception operations at the POD include all those functions necessary to receive and clear unit personnel and equipment through the POD.

As a Senior Transportation Officer, your knowledge concerning APOD activities will ensure smooth force integration for units and their equipment arriving in theater.

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Lead-in

LEAD-IN

Aerial Port of Debarkation activities allow Reception, Staging, Onward Movement, and Integration (RSOI) to take place.

RSOI operations are necessary for commanders to build combat power.

The four segments of RSOI are:

- Reception: Unloading personnel and equipment from strategic transport assets, managing port marshalling areas, transporting personnel, equipment, and materiel to staging areas, and providing logistics support services to those units.
- Staging: Organizing personnel, equipment, and basic loads into movement units, preparing the units for onward movement, and providing logistics support for units transiting the staging area.
- Onward Movement: Moving units from reception facilities and staging areas to the tactical assembly areas (TAAs) or other theater destinations, moving non-unit personnel to gaining commands, and moving sustainment supplies to distribution sites.
- Integration: The synchronized transfer of capabilities into an operational commanders force prior to mission execution.

All activity at the Aerial Port of Debarkation enables the Reception, Staging, Onward Movement, and Integration process to begin.

Those first days during initial arrival in theater are critical to rapid build-up of combat power.

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JTF-PO

The Joint Task Force-Port Opening (JTF-PO) is an Army and Air Force team that is trained, organized, and equipped to operate a significant APOD 24 hours a day, 7 days a week, for up to 45 to 60 days.

The JTF-PO element will perform the following to lay the ground work for the RSOI process:

- Receive personnel and cargo: Passengers and equipment off-loaded, moved to temporary Holding Areas, and consolidated for movement to final destination. Units may assist here.
- Customs/agricultural inspections: Conducted if not done at the APOE, were deemed inadequate, or to meet Host Nation requirements.
- Submit Arrival Reports.
- Coordinate transportation for Onward Movement and movement clearances.
- Process personnel/equipment for movement: Support organizations process and coordinate documentation (manifests, government bills of lading) for materiel and equipment passing through the APOD.
- Complete unit inspections and process movement documents: Unit personnel moving organic vehicles, helicopters, or other unit cargo perform required maintenance, repairs, and safety inspections.

Joint Task Force-Port Opening is a concept initiated by the United States Transportation Command, to integrate the efforts of the Army and Air Force at the Aerial Port of Debarkation, so that reception and onward movement of forces and equipment is seamless and immediate to the customer.

After a joint assessment team confirms that an Aerial Port of Debarkation is capable of supporting military operations, the Joint Task Force-Port Opening element is deployed to receive forces, equipment, and supplies.

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Key Organizations and Activities

Arriving unit UMOs interface with and are supported by:

- USAF Aerial Port Squadron (APS) or Contingency Response Element (CRE)
- Arrival Airfield Control Group (AACG)
- Movement Control (Movement Control Agency, Port Movement Control Team)
- Designated support organizations from receiving command
- Contracted civilians
- Host Nation support

The term, Tanker Airlift Control Element (TALCE), has been changed in present doctrine to the Contingency Response Element (CRE).

Reception at the Aerial Port of Debarkation is coordinated by a Contingency Response Element and the Arrival Airfield Control Group.

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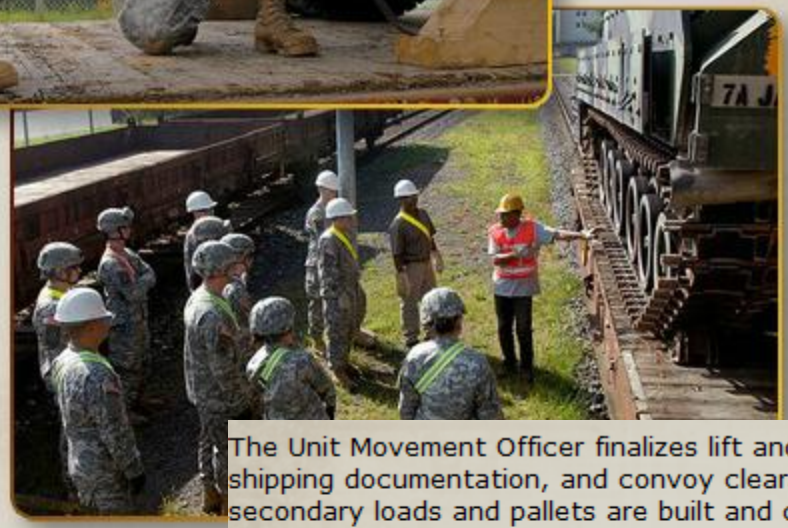
UMO Duties

During APOD operations, the Unit Movement Officer (UMO) has certain considerations and duties, to include:

- Develop a unit plan for departing Marshalling Area based on higher HQ's, Army Service Component Command (ASCC), and theater RSOI plan.
  - Unit may move equipment to a railhead for onward movement.
  - Vehicles may convoy and Soldiers move by bus.
- Coordinate move with Movement Control Team (MCT), or other supporting movement organization.
- Coordinate with the Sustainment Brigade, or other support units operating a railhead, bus transport, etc.

A possible consideration would be to split duties between the UMO and the UMO alternate, allowing the UMO to arrive early to coordinate theater movement issues, whereas the alternate supports APOE departure and arrives later in flow.



The Unit Movement Officer finalizes lift and load plans, shipping documentation, and convoy clearances as secondary loads and pallets are built and containers are stuffed.

The Unit Movement Officer also maintains a deployment binder for reference and continuity.

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Arrival Airfield Operations

Although arrival operations are not part of the marshalling process, they are important in air movement. If not orderly, arrival operations could adversely affect the mission.

Arrival operations take place in three main areas:

- The Off-Loading Ramp Area
- The Holding Area
- The Unit Marshalling Area

Reception operations include all those functions required to receive and clear personnel, equipment, and materiel through the Aerial Port of Debarkation.

This process may be modified or streamlined for combat off-load operations.

Arriving at the Aerial Port of Debarkation begins the "reception" segment of the joint reception, staging, onward movement, and integration phase of deployment operations.

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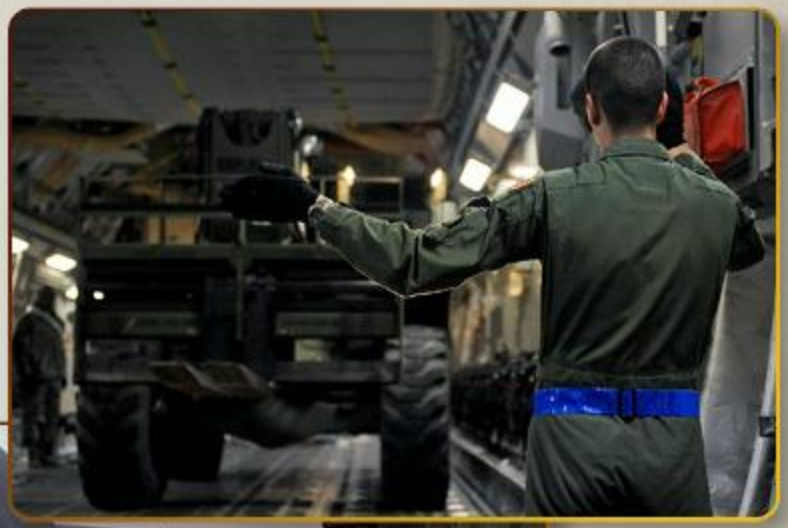
Arrival Elements

An Aerial Port of Debarkation (APOD) is an airfield designated to serve as an authorized port of entrance into the country in which it is located.

Both USAF and Army have responsibilities at an APOD. Reception at the APOD is coordinated by a CRE and an Arrival Airfield Control Group (AACG).

The CRE supervises off-loading arriving aircraft. The AACG escorts the chalks to the Holding Area and assists the unit in assembling and moving to the Marshalling Area.

Elements of a Movement Control Team (MCT) and inland cargo transfer company typically operate the AACG; however, the mission can be accomplished by almost any unit with the properly trained personnel and equipment.



When serving as a Unit Movement Officer or in any leadership or technical capacity in the movement process, unit commanders rely heavily on unit movement experts during the arrival/reception phase of a unit's move into an exercise location, operation area, or theater of operations.

There are various arrival elements that the Unit Movement Officer will integrate with who are responsible for the health, welfare, and life support of arriving forces and for assisting with their onward movement.

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Off-Loading Ramp Area

Off-Loading Ramp Area responsibilities are shared by the CRE and the AACG.

The AACG escorts chalks to the Holding Area and assists in assembling/moving units to the Marshalling Area, while the CRE supervises off-loading arriving aircraft.

The following duty positions in the AACG require formal training and certification:

- **Shift Leader**: qualified in all AACG duties.
- **Transportation NCO**: supervises equipment preparation, HAZMAT certification, and load planning.
- **Scale Operator**: performs weighing/marking duties for air movement.
- **Forklift Operators and Truck Drivers**: licensed and understand airfield operating rules.

The Off-Loading Ramp Area is where the aircraft are off-loaded. The Contingency Response Element controls the Off-Loading Ramp Area activities.

Each load is released to the Arrival Airfield Control Group for return to unit control at the Holding Area.

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CRG/CRE

The Contingency Response Group or Contingency Response Element:

- Advises the AACG of the airflow and expected arrival of aircraft.
- Plans and supervises aircraft parking.
- Receives passenger and cargo manifests from the aircraft loadmaster.
- Supervises off-loading the aircraft, including removal of shoring and dunnage.
- Provides off-loading equipment, including operators.
- Receives cargo manifests and ensures inbound cargo data is scanned by In-Transit Visibility (ITV) interrogator.

AACG

The Arrival Airfield Control Group:

- Maintains coordination with the arriving unit and CRE.
- Provides support to arriving units as determined during the joint planning conference.
- Coordinates for a detail from the arriving unit.
- Provides off-load teams and support equipment to the CRE as required.
- Accepts each planeload from the CRE at the established release point.
- Ensures that shoring and dunnage from the aircraft is removed and transferred to the arriving unit.

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Holding Area

The Holding Area is a location normally adjacent to the ramp, where the unit halts briefly to ensure that they have their personnel and equipment before moving to the Marshalling Area.

Within the Holding Area, the AACG:

- Coordinates with the CRE and the arriving unit.
- Provides support to arriving unit outlined in planning conference.
- Scans inbound unit equipment and cargo and submits the information to the server.
- Coordinates movement of aircraft pallets to the unit Marshalling Area for pallet breakdown.
- Provides fuel, oil, and minor maintenance for transported vehicles.
- Provides emergency services as required.

Arriving units are responsible for providing unit liaison personnel to the Arrival Airfield Control Group, and for assisting them as required.

In the Holding Area, arriving units locate their equipment, prepare it for movement to the Marshalling Area, and generally begin the process of "marrying-up" with organic supplies and equipment.

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APOD Operations

Prompt clearance of cargo from the APOD is essential to the efficiency and success of the total theater logistics system.

It is also necessary to avoid serious congestion in the port holding area and avoid violating Maximum-on-the-Ground (**MOG**) restrictions.

Support elements in the Marshalling Area:

- Maintain a central control/inspection point.
- Provide a security area for sensitive items.
- Provide life support facilities.
- Create a traffic circulation plan showing movement flow into the Marshalling Area.
- Provide maintenance, fuel for vehicles and equipment, and emergency supplies / equipment for isolating and disposing of HAZMAT spills.
- Use the Transportation Coordinator's Automated Information for Movement System II (TC-AIMS II) software to consolidate movement requirements and submit movement taskings.
- Scan cargo and equipment and it enters and leaves the Marshalling Area.
- Use TC-AIMS II to obtain convoy clearances, special hauling permits for arriving units, and arrange for movement of cargo and equipment beyond the requesting units' organic capabilities.

Marshalling Area

Prompt clearance of cargo from the Aerial Port of Debarkation is essential to the efficiency and success of the total theater logistics system.

Marshalling Areas are established to allow rapid clearing of the Aerial Port of Debarkation, and to allow units to complete the process of restoring their equipment and supplies from shipment configuration to operational configuration, and get ready for onward movement.

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Maximum-on-the-Ground

MOG stands for "Maximum-on-the-Ground." There are two primary types of MOG: parking MOG and working MOG.

Parking MOG is the total number of planes that can be parked at an air facility. Parking MOG is affected by both the overall size of the facility and by how available space is managed.

Working MOG refers to how many or how quickly parked aircraft can be off-loaded, materiel move through the port, and aircraft serviced and prepared for departure.

The factors that affect working MOG are material handling equipment, trucks, buses, and other surface transport vehicles, road networks, aircraft support equipment, fuel tankers, and sufficient numbers of trained personnel.

Ideally, working MOG equals parking MOG. When it doesn't, backlogs can occur.

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APOD Operations

Key Points

The following key points regarding Aerial Port of Debarkation operations were discussed:

- Key Organizations
- Roles and responsibilities
- Arrival Airfield Operations
- The Off-Loading Ramp Area
- The Holding Area
- The Marshalling Area

KEY POINTS

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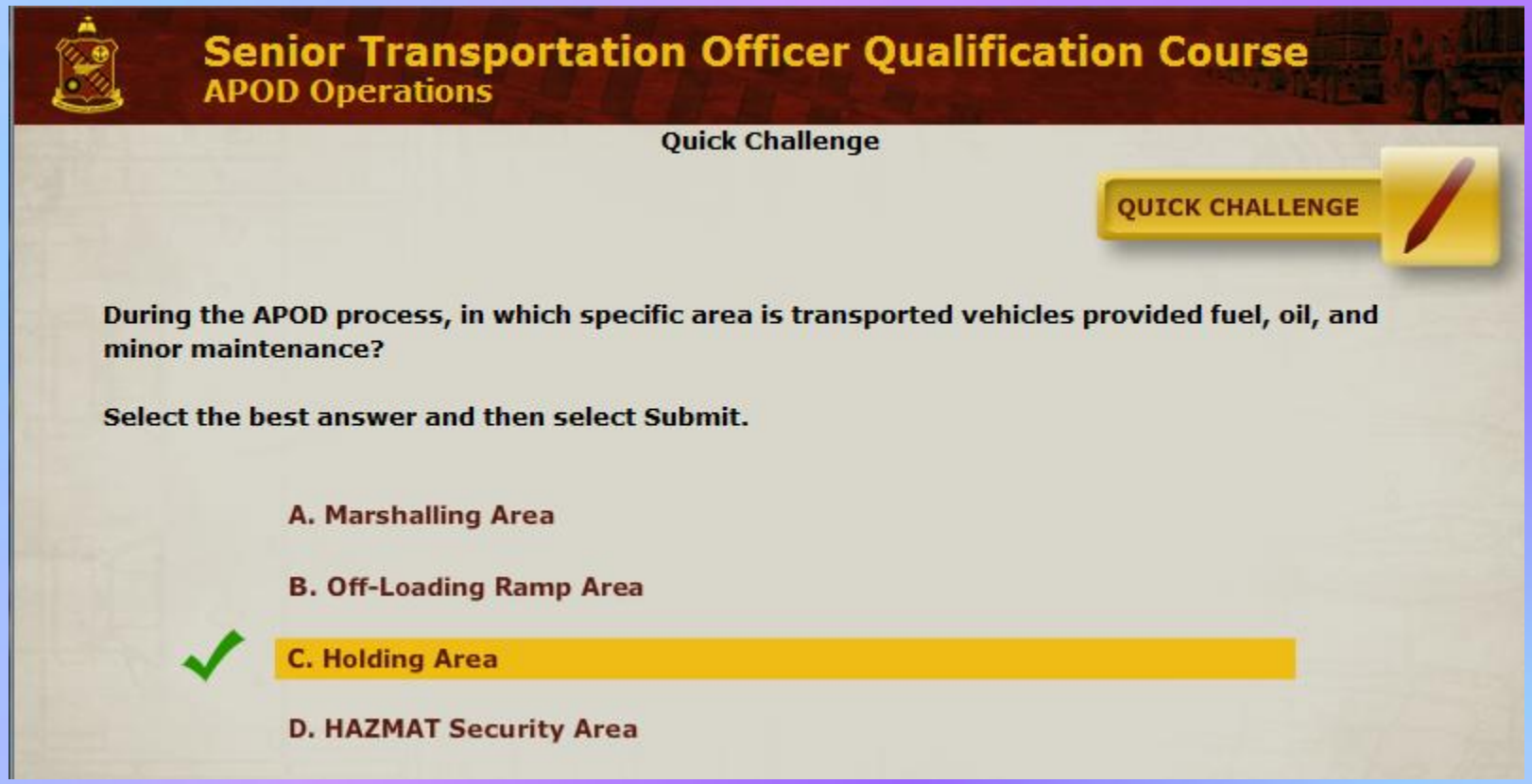
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APOD Operations
Quick Challenge
QUICK CHALLENGE
During the APOD process, in which specific area is transported vehicles provided fuel, oil, and minor maintenance?
Select the best answer and then select Submit.
A. Marshalling Area
B. Off-Loading Ramp Area
C. Holding Area
D. HAZMAT Security Area

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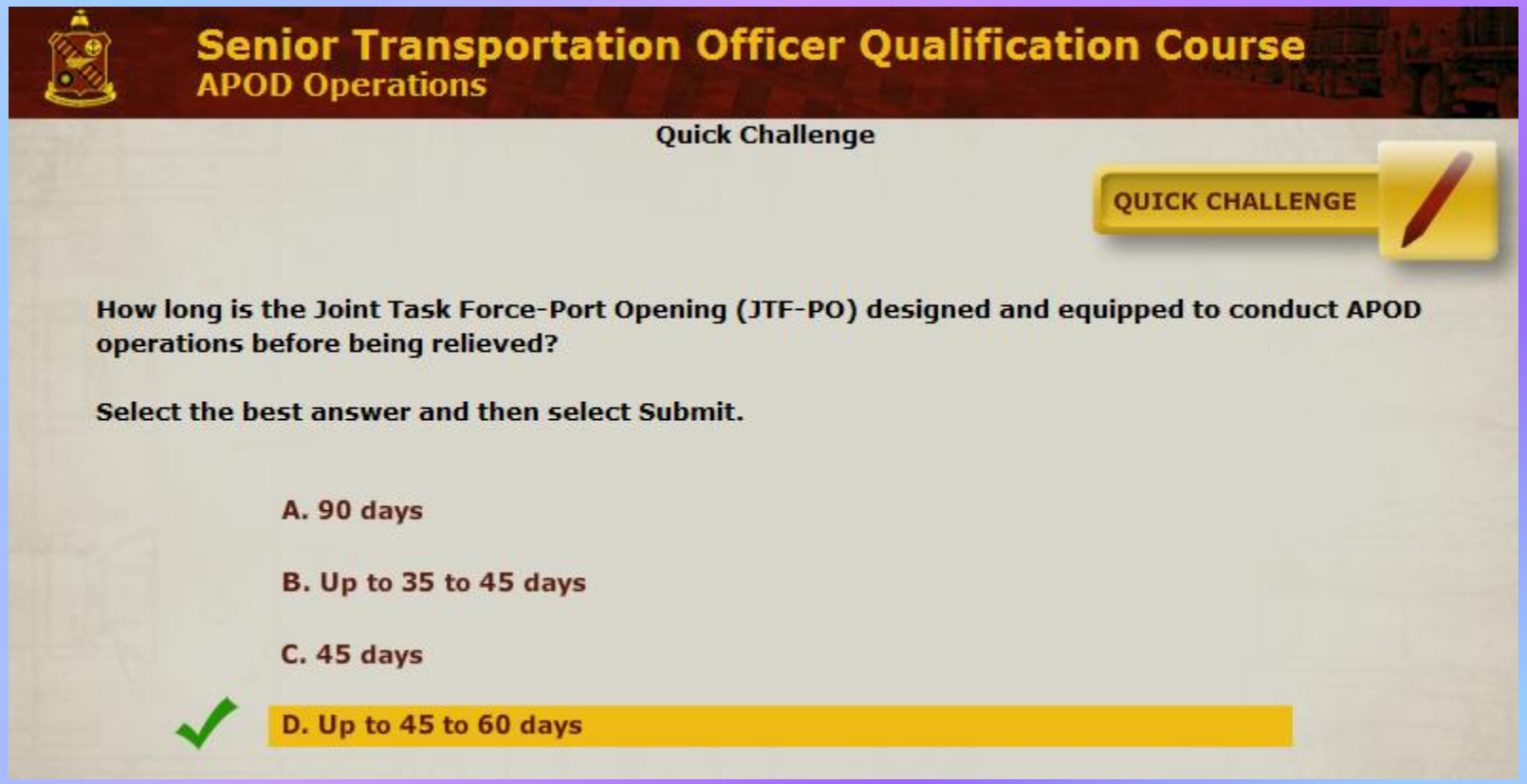
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APOD Operations
Quick Challenge
QUICK CHALLENGE
How long is the Joint Task Force-Port Opening (JTF-PO) designed and equipped to conduct APOD operations before being relieved?
Select the best answer and then select Submit.
A. 90 days
B. Up to 35 to 45 days
C. 45 days
D. Up to 45 to 60 days

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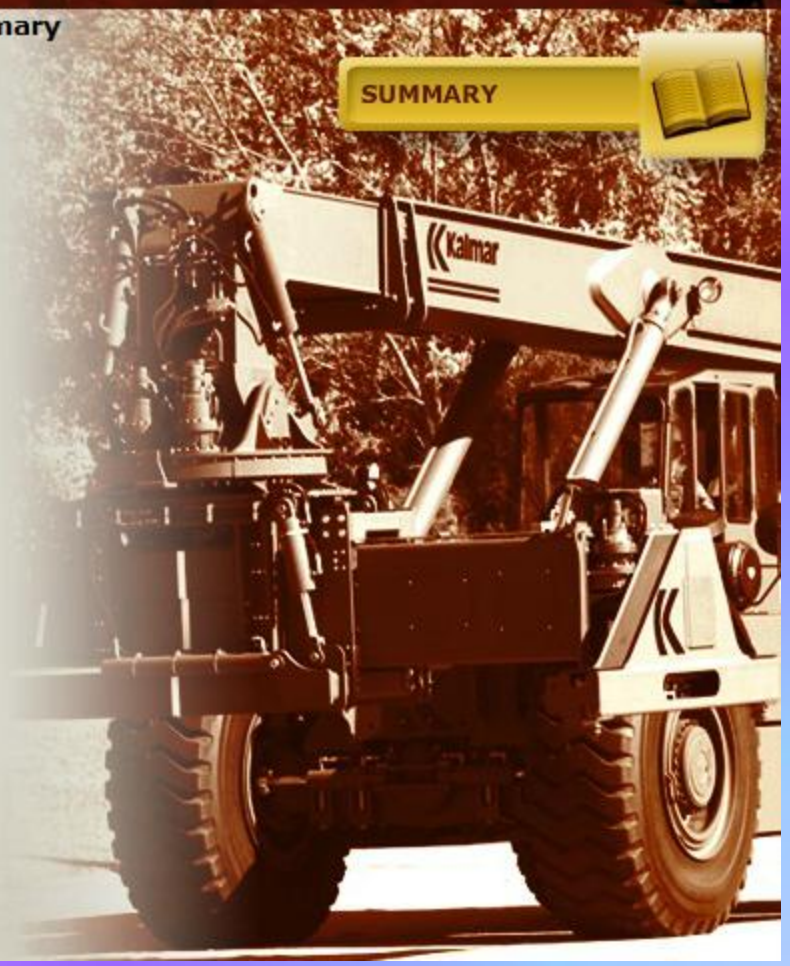
Summary

In this lesson, you have learned about the organizations and activities associated with Aerial Port of Debarkation operations to include:

- The JTF-PO element
- Key organizations
- UMO duties
- Arrival Airfield Operations and elements
- The Off-Loading Ramp, Holding, and Marshalling Areas

The Senior Transportation Officer must be familiar with the key organizations and Unit Movement Officer responsibilities to ensure proper supervision of APOD activities.



Good luck on the assessment!